SB 979_CBF SUPPORT.pdf
Uploaded by: Allison Colden
Position: FAV

CHESAPEAKE BAY FOUNDATION

Environmental Protection and Restoration
Environmental Education

Senate Bill 979

Prohibition of Dredging on Man-O-War Shoals

Date: March 16, 2022
To: Education, Health, and Environmental Affairs Committee

Position: **SUPPORT**
From: Allison Colden, Sr. Fisheries Scientist

The Chesapeake Bay Foundation strongly **SUPPORTS** Senate Bill 979 as means to protect the last remaining three-dimensional oyster reef in Maryland waters. SB 979 would prohibit destructive dredging of buried oyster shells at Man-O-War Shoals by the Department of Natural Resources (DNR).

Man-O-War Shoals, located near the mouth of the Patapsco River in Baltimore County, is the last remaining relic three-dimensional oyster reef in the upper Chesapeake Bay. MOW Shoals once supported a robust oyster population and currently serves as important habitat for several commercial and recreational fishes.

Proponents of dredging at Man-O-War Shoals cite falling oyster numbers throughout the Bay as a need to remove shell to place in other areas; however, the limited, short-term shell availability of shell is unlikely provide a significant benefit and is outweighed by the adverse effect on habitat. For example, if DNR dredged MOW Shoals, and 100% of the shell were allocated to the oyster industry, targeted plantings on the top five harvest-producing areas could only cover 2% of the oyster habitat in those regions, planted one time. Given the half-life of oyster shell is estimated to be 3-6 years and oysters do not usually reach market size until 3 years old, those areas could be harvested twice before the shell is gone. Without a long-term plan to increase oyster habitat in the Bay through restoration and sustainable harvest management, the dredging of MOW Shoal will result in a net loss of oyster and fish habitat.

Though the number of oysters on MOW Shoals has diminished, the habitat remains critically important for American eel, shad, bluefish, croaker, herring, striped bass, summer flounder, blue crab, spot and weakfish. Annual trawl surveys have documented 38 different fish species in the vicinity of Man-O-War Shoals. The loss of recreational angling opportunities was one of the most often cited sources of opposition to this permit in the Army Corps' public comment process. In total, 54 out of 57 public comments to the Army Corps opposed the permit to dredge MOW Shoals, including several County Oyster Committees and the Maryland Watermen's Association.

Fortunately, recent scientific studies have demonstrated that alternatives, including granite and crushed concrete, are a viable substitute for oyster shell, with stone and crushed concrete reefs supporting as many or more oysters as shell reefs with similar rates of survival. Additionally, pilot studies in Virginia have utilized gravel as substrate on harvest bars, which supported high levels of recruitment and were described by local watermen as a "viable option." DNR's 2019 Maryland Oyster Management Plan includes plans to

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Phone (410) 268-8816 ▪ Fax (410) 280-3513

utilize these types of alternative materials on harvest bars in pilot programs in Maryland, which if successful, further reduces the need for shell.

Given the newly demonstrated efficacy of alternative substrates, the extremely short-term and limited benefit the shell from MOW Shoal could provide, and the negative impacts to fish habitat, CBF believes the dredging of the last remaining three-dimensional oyster reef in upper Chesapeake Bay is ill-advised.

CBF urges the Committee's FAVORABLE report on SB 979. Please contact Dr. Allison Colden, Maryland Senior Fisheries Scientist, at acolden@cbf.org or 443-482-2160 with any questions.

SB 979 MOW Shoal Dredging Prohibition COA SUP.pdf
Uploaded by: Chesapeake Oyster Alliance
Position: FAV

Chesapeake
OYSTER ALLIANCE
10 Billion for the Bay

ANNAPOLIS AQUACULTURE - BLUE OYSTER ENVIRONMENTAL - CHESAPEAKE BAY FOUNDATION - CHESAPEAKE BEACH OYSTER CULTIVATION SOCIETY - COASTAL CONSERVATION ASSOCIATION MARYLAND - FRIENDS OF ST. CLEMENTS BAY LIVING CLASSROOMS FOUNDATION - MARK STREET VENTURES LLC - THE NATIONAL AQUARIUM, BALTIMORE - PIRATES COVE OYSTER CO. - SHORERIVERS - TRUE CHESAPEAKE OYSTER CO LLC - OYSTER COMPANY OF VIRGINIA - REEFTEK, LLC

Senate Bill 979
Prohibition of Dredging on Man-O-War Shoals

DATE: March 16, 2022 POSITION: **SUPPORT**

The Chesapeake Oyster Alliance is a broad coalition of non-profits, community organizations, oyster growers, academic institutions, and business owners with the shared goal of adding 10 billion oysters in the Bay by the year 2025. With a focus on oyster restoration, science-based fishery management, and increased aquaculture, the Chesapeake Oyster Alliance aims to accelerate oyster recovery efforts and in so doing the recovery of the Chesapeake Bay.

The Chesapeake Oyster Alliance strongly supports Senate Bill 979 and recommends a favorable report from the Senate Education, Health and Environmental Affairs Committee.

Man-O-War Shoal is a popular fishing and boating location for many upper Bay residents, as well as an important area for commercial crabbing and the harvest of spat on shell oyster plantings. This bill would prohibit the dredging of Man-O-War Shoal and protect these existing uses.

From 1960 to 2006, nearly 200 million bushels of buried shell were removed from numerous relic oyster bars or buried shell deposits in the upper Bay and used to supplement the wild harvest oyster industry throughout various portions of the middle and lower Chesapeake. The program, frequently called the shell or repletion program, was halted when available shell deposits were exhausted, and when public opposition of the program increased. The areas previously dredged lost their three-dimensional relief and are now largely covered by silt and degraded in value to local Bay stakeholders.

In 2008, legislation directed the Department of Natural Resources (DNR) to pursue a permit to continue dredging for buried shell in the upper Bay but did not specifically designate Man-O-War as a target for such efforts.

Shell is a valuable resource for oyster restoration, wild harvest subsidies, and some aquaculture operations, but DNR's plan for the use of buried shell from Man-O-War includes regional ecological and economic impacts that far outweigh the overall benefit to the state.

Since 2008, major advancements have been made in the use of alternatives to buried shell. Fresh shell recycling programs continue to grow in the region, and alternatives like limestone, granite, and environmentally clean concrete have all been proven as viable substrates to replace the use of buried shell in restoration, aquaculture, and wild harvest.

Given the numerous alternatives to buried shell, the past impacts to the upper Bay, and irreversible changes proposed in DNR's plan, Man-O-War Shoal should be removed as an option for shell dredging activities.

For these reasons, the Chesapeake Oyster Alliance urges a **favorable** report on Senate Bill 979 from the Education, Health, and Environmental Affairs Committee. Please contact David Sikorski (david@ccamd.org; (443) 621-9186) with any questions.

SB979_1_CCA.pdf
Uploaded by: David Sikorski
Position: FAV

COASTAL CONSERVATION ASSOCIATION MARYLAND

ANGLERS WORKING TO CONSERVE, PROMOTE AND ENHANCE MARYLAND'S MARINE RESOURCES

March 16, 2022

To: Honorable Paul G. Pinsky, Chair
Honorable Cheryl C. Kagan, Vice Chair
Honorable Members of the Senate Education, Health & Environmental Affairs Committee

Re: **Senate Bill 979** – Prohibition Dredging on Man- O- War Shoals

CCA Maryland Position: SUPPORT

As anglers, and avid users of our natural resources, CCA Maryland members work hard to promote sensible science-based management measures to support sustainable fisheries for the benefit of the general public, and the long-term health of the Chesapeake Bay.

From 1962 through 2006, the Department of Natural Resources contracted for a massive hydraulic dredge to strip mine three-dimensional structure in the upper Bay removing over **196 million bushels of buried shell**. This shell was barged to other areas of the Bay and used to supplement areas degraded by wild oyster harvest and disease.

This previous action came at a public cost of approximately **$49 million dollars** and an unknown ecological impact through the removal of important habitat and economic cost by fishing areas for recreational anglers, charter business and local watermen.

The amount of habitat already removed from the upper Bay is comparable to the volume of:

- ~200 times the US Capitol Rotunda
- ~ 6 times Houston Astrodome
- ~ 100 times the Epcot Center Dome
- ~ 3 times the great pyramids of Giza

We strongly urge you to focus on more productive investments of public dollars in building habitat, and not returning to failed policies of the past which have no long lasting ecological or economic benefits.

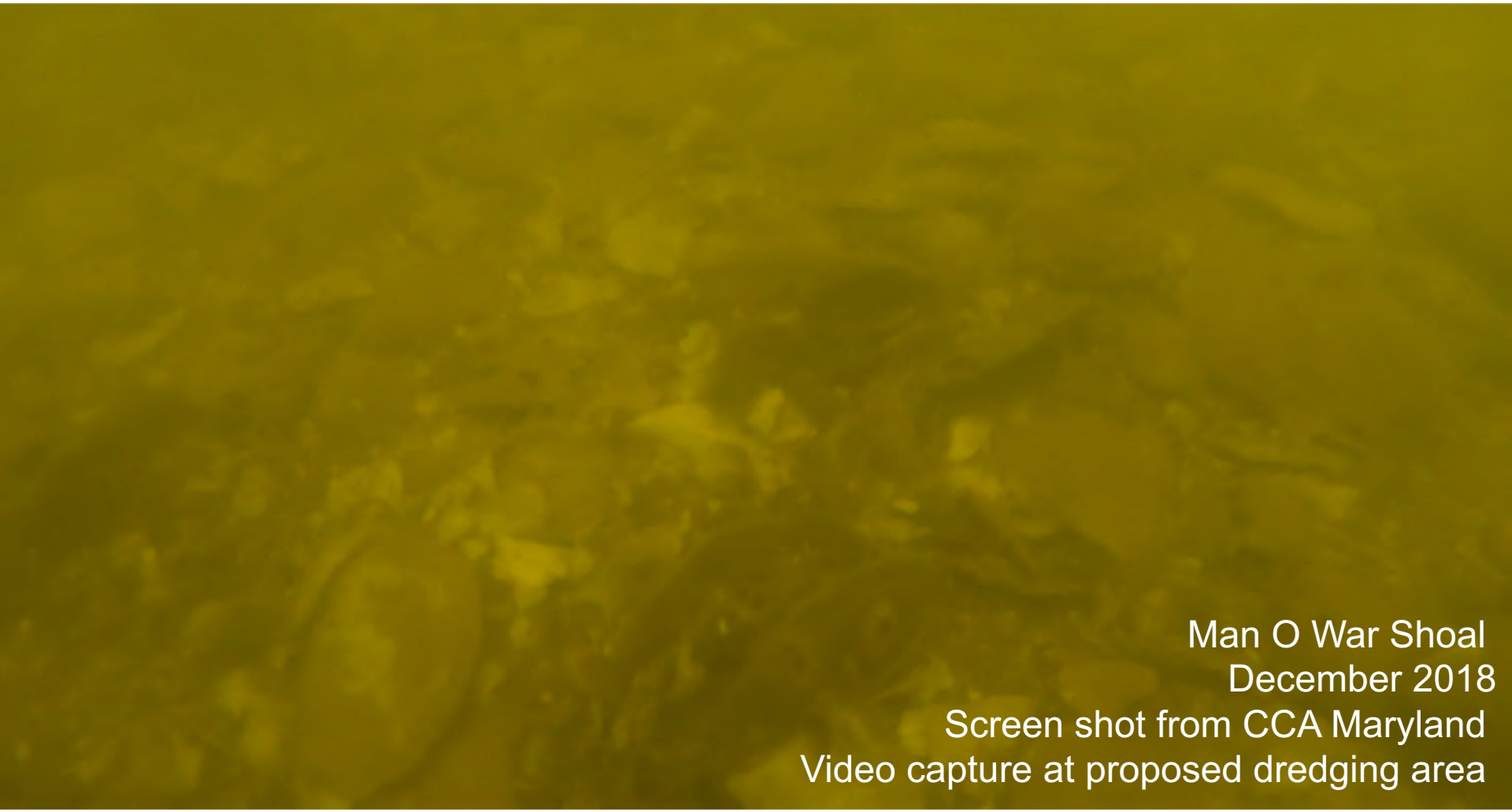
Habitat should not be removed in one portion of the Bay to attempt to rebuild it elsewhere.

For these reasons, we respectfully request a FAVORABLE vote on SB 979 *For further discussion regarding this issue, please contact CCA Maryland Executive Director, David Sikorski – (443)621-9186 – david@ccamd.org*

*A video including information from multiple stakeholders can be found at: savemanowar.org

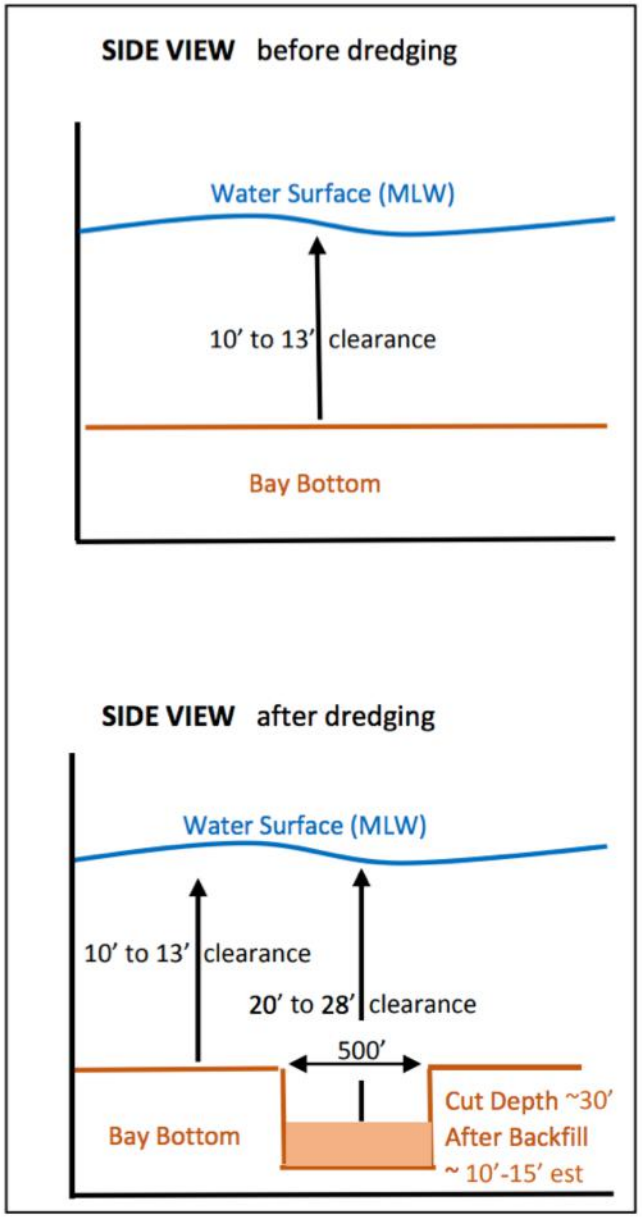
**Additional images regarding the equipment used for dredging, the three-dimensional topography/bathymetry and images of the actual bottom of Man O War Shoal are attached in the following pages.


Baltimore

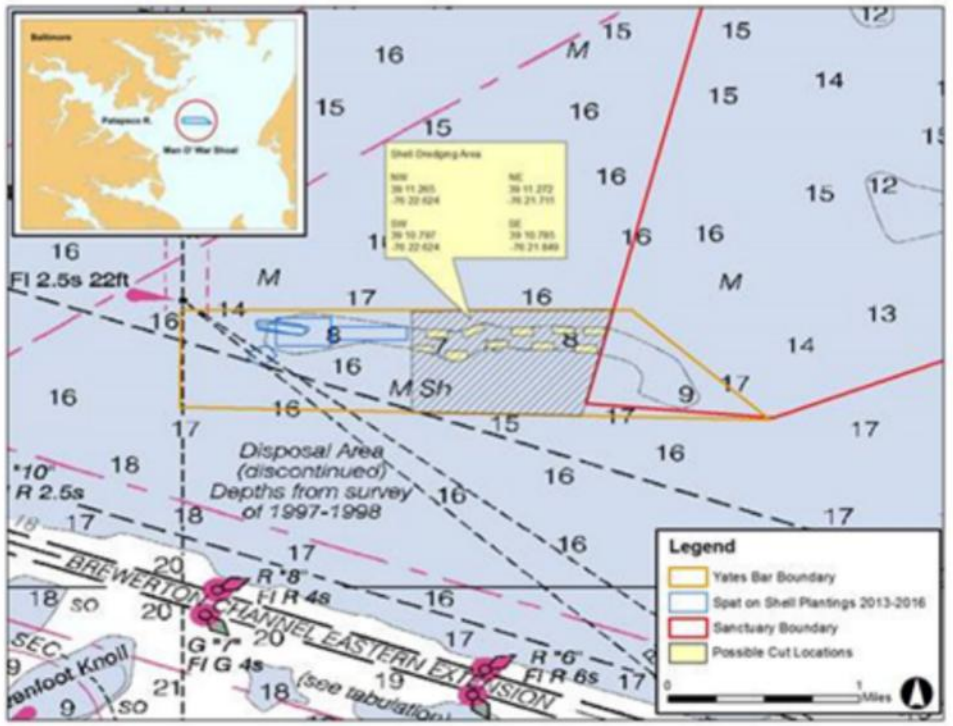


Man O War Shoal
December 2018
Screen shot from CCA Maryland
Video capture at proposed dredging area

SIDE VIEW of Dredge Cut

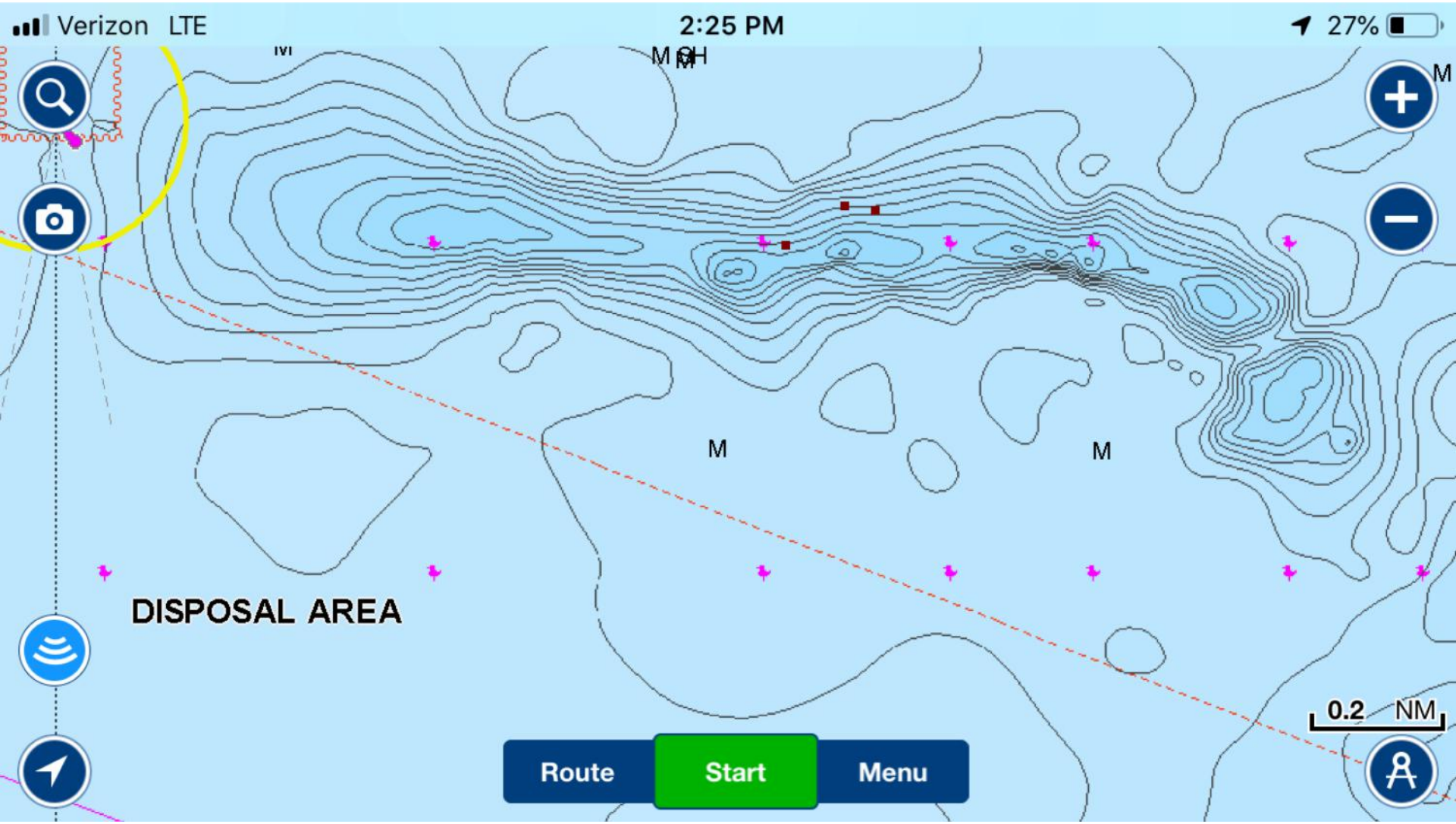


TOP VIEW of Dredge Cuts



- The proposed shell dredging area is the crosshatched area.
- Locations of dredge cuts are conceptual, for illustration purposes.
- Actual locations determined before dredging and according to the permit.
- Cut dimensions will be 500' maximum width and a length no greater than 1/3 of the way into the charted edge of the shoal (average of 275' long).
- Undredged bottom will be left between cuts.
- No greater than 10 cuts will be made to remove the proposed 5 million bushels of shell.

MD DNR Permit Application Proposed Plan Map & Dredge Cut Diagram 2/2017



Current bathymetric (under water topography) chart of Man O War Shoal
Source: Navionics Application

Dredge in operation removing buried shell
Source: Virginia Marine Resources Commission

BaltimoreCounty_FAV_SB0979.pdf
Uploaded by: Joel Beller
Position: FAV

JOHN A. OLSZEWSKI, JR.
County Executive

JOEL N. BELLER
Acting Director of Government Affairs

JOSHUA M. GREENBERG
Associate Director of Government Affairs

MIA R. GOGEL
Associate Director of Government Affairs

BILL NO.: **Senate Bill 979**

TITLE: Prohibition of Dredging on Man-O-War Shoals

SPONSOR: Senator Salling

COMMITTEE: Education, Health, and Environmental Affairs

POSITION: **SUPPORT**

DATE: March 16, 2022

Baltimore County **SUPPORTS** Senate Bill 979 – Prohibition of Dredging on Man-O-War Shoals. This legislation would prohibit the Department of Natural Resources (DNR) from including the dredging of buried oyster shells on Man-O-War Shoals as a part of the fishery management plan and ensure that DNR is not allowed to peform any dredging on this shoal.

Protecting the Man-O-War Shoals is essential to the Chesapeake Bay ecosystem, and dredging this area may have unintended, yet catastrophic consequences. Dredging creates uninhabitable conditions for fish and other local underwater wildlife, many of which are vital for recreational and commercial fishing. Baltimore County Watermen's Association notes that dredging may contribute to significant declines in crab populations which are critical to Maryland's economy. Man-O-War Shoals is an essential economic and recreational resource to the residents of Baltimore County; the State's partnership with the County would guarantee the Shoals' continued ecological health.

Senate Bill 979 prevents the dredging of oyster shells on Man-O-War Shoals. If dredging were to continue, Maryland could lose a significant source of revenue and treasured natural resource. Efforts to preserve Man-O-War Shoals are jointly supported by the Baltimore County Executive and the Baltimore County Council.

Accordingly, Baltimore County requests a **FAVORABLE** report on Senate Bill 979. For more information, please contact Joel Beller, Acting Director of Government Affairs at jbeller@baltimorecountymd.gov.

SB979 letter of support Baltimore County Senate De

Uploaded by: johnny salling

Position: FAV

KATHERINE KLAUSMEIER
Legislative District 8
Baltimore County

President Pro Tem Emeritus

Finance Committee

Chair
Baltimore County Senate Delegation

The Senate of Maryland

ANNAPOLIS, MARYLAND 21401

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11 Bladen Street, Room 123
Annapolis, Maryland 21401
410-841-3620 · 301-858-3620
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Katherine.Klausmeier@senate.state.md.us

February 23, 2022

The Honorable Paul G. Pinsky
Chair, Senate Education, Health, and Environmental Affairs Committee
2 West, Miller Senate Office Building
11 Bladen Street
Annapolis, MD 21401

Dear Chairman Pinsky,

Please be advised that the Baltimore County Senate Delegation has given a Favorable Recommendation to **SB 979 – Prohibition of Dredging on Man-O-War Shoals.**

If you need additional information, please do not hesitate to contact me.

Sincerely,

Sen Kathy Klausmeier

Senator Kathy Klausmeier
Chair, Baltimore County Senate Delegation

sb979 letter of support BaltimoreCounty_FAV_SB0979
Uploaded by: johnny salling
Position: FAV

JOHN A. OLSZEWSKI, JR.
County Executive

JOEL N. BELLER
Acting Director of Government Affairs

JOSHUA M. GREENBERG
Associate Director of Government Affairs

MIA R. GOGEL
Associate Director of Government Affairs

BILL NO.: **Senate Bill 979**

TITLE: Prohibition of Dredging on Man-O-War Shoals

SPONSOR: Senator Salling

COMMITTEE: Baltimore County Senate Delegation

POSITION: **SUPPORT**

DATE: March 14, 2022

Baltimore County **SUPPORTS** Senate Bill 979 – Prohibition of Dredging on Man-O-War Shoals. This legislation would prohibit the Department of Natural Resources (DNR) from including the dredging of buried oyster shells on Man-O-War Shoals as a part of the fishery management plan and ensure that DNR is not allowed to peform any dredging on this shoal.

Protecting the Man-O-War Shoals is essential to the Chesapeake Bay ecosystem, and dredging this area may have unintended, yet catastrophic consequences. Dredging can negatively impact other fish in the area, many of which are vital for recreational and commercial fishing. Baltimore County Watermen's Association has also noted that dredging may contribute to significant declines in crab populations which are vital to Maryland's economy. Man-O-War Shoals is a vital economic and recreational resource to the residents of Baltimore County, and it is critical that the State partner with the County in ensuring its continued ecological health.

Senate Bill 979 prevents the dredging of oyster shells on Man-O-War Shoals. This bill protects the ecosystem of Man-O-War Shoals, as well as the economy that its fisheries provide. Without this legislation, Maryland could lose a significant source of revenue and treasured natural resource. Efforts to preserve Man-O-War Shoals are jointly supported by the Baltimore County Executive and the Baltimore County Council.

Accordingly, Baltimore County requests a **FAVORABLE** report on Senate Bill 979. For more information, please contact Joel Beller, Acting Director of Government Affairs at jbeller@baltimorecountymd.gov.

sb979 Salling Ltr to Committee.pdf
Uploaded by: johnny salling
Position: FAV

JOHNNY RAY SALLING
Legislative District 6
Baltimore County

Budget and Taxation Committee

Public Safety, Transportation, and Environment Subcommittee

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THE SENATE OF MARYLAND
ANNAPOLIS, MARYLAND 21401

March 15, 2022

Education, Health, and Environment Committee

Re: SB979- Prohibition of Dredging on Man-O-War Shoals

Position: Favorable

Dear Chair, Vice Chair, and Committee Members,

I would like to ask for your support for this bill which would prohibit the dredging of Man-O-War Shoals.

Man-O-War is known as one of the best fishing spots for perch and striped bass, and dredging will very likely have a negative impact on the quality of fishing in that area as well as the natural habitat. The dredging program in the upper bay started in the early 1960's and continued until 2006. However, if this program was so successful, we have to ask why have we run out of areas to dredge and why are oyster levels at such a historic low? I do not deny that there are other contributing factors to the low oyster population, but the fact remains that many decades of dredging and millions of dollars spent in moving shell from one place to another has not resulted in a robust and thriving oyster community. The idea of dredging is a short sighted solution to a long term problem, because if you take more shell than you are replacing, eventually you run out of shell. After the shell is gone there is no more shell, the shoal is destroyed, and the marine life is gone.

We need to have a holistic approach that includes using other sources of substrate and having robust recycling and reclamation programs. We should not destroy one habitat to try to create another.

I ask for your support on a favorable vote for this bill.

Sincerely,

Senator Johnny Ray Salling

SB979_kblewis_favorable.pdf
Uploaded by: Kenneth Lewis
Position: FAV

Senate Bill 979

Prohibition of Dredging on Man-O-War Shoal

Date: March 16, 2022
To: Education, Health and Environmental Affairs Committee

Position: Support
From: Kenneth B. Lewis, M.D.

I strongly SUPPORT Senate Bill 979 that will permanently protect Man O War Shoal from destructive dredging for buried oyster shell as proposed by the Department of Natural Resources (DNR).

This is essentially a marine environmental protection issue that will protect this upper Chesapeake Bay unique underwater area that has been used in a non-destructive way by generations of Marylanders. As noted in earlier testimony the vast majority of a diverse group of citizens who utilize the area have testified against
dredging.

Since it is unseen beneath the water the environmental, social and economic benefits of the destruction of this common property resource are not widely appreciated by many citizens. If this were a discussion of a quite visible extractive operation such as strip mining for coal, or creating a stone or gravel mine on public land there would likely be a very loud negative reaction.

There is no public imperative for dredging buried oyster shell from MOW. Oyster restoration in our five designated sanctuaries is proceeding as planned, oyster aquaculture businesses are increasing and reported wild oyster harvest this season is predicted to increase substantially.

I urge you to give SB 979 a FAVORABLE vote and preserve this unique Chesapeake Bay area for future generations. Please contact Kenneth B. Lewis, M.D, at kenbonnyl@verizon.net or 410-812-1324 for questions

SB 979 Testimony Man O War Shoal.1_pdf.pdf
Uploaded by: Lani Hummel
Position: FAV

Date: March 16, 2022Position: SUPPORT for SB 979, Man O War Dredging ProhibitionTo: Senate Education, Health and Environmental Affairs CommitteeFrom: Lani Hummel, lanihummel@aol.com, Annapolis RoadsMan O War Shoal is an important fishing and crabbing location that supports the local ecology and economy. Oyster harvesting also occurs on the shoal. Local county watermen invest in oyster plantings on the shoal that they harvest when the oysters reach market size. The vertical relief of the shoal helps to break up tidal flows, oxygenating the water, and thereby creates thriving habitat for fish, crabs, oysters, mussels, and more.The proposed shell dredging will cut large holes on either side of the shoal, forever impacting its stability and value as habitat and structure.From 1960 to 2006, the Maryland Department of Natural Resources (DNR) spent nearly 49 million dollars mining nearly 200 million bushels of buried shell from the Upper Bay. The mined shell was then barged into the southern Bay to be used to improve habitat for oyster plantings. This program was a major subsidy for the public oyster fishery. When concentrated shell deposits were exhausted and public opposition to dredging developed, the program was halted. By then, the Upper Bay bottom had been forever altered. The program failed to produce long-term benefits for the oyster industry or the oyster resource. So, the public had nothing to show for the use of this valuable, finite natural resource.In summary, since oyster shell degrades over time, there are no long lasting public benefits in using buried shell to enhance habitat elsewhere. Maryland leaders should focus on other actions that can improve oyster habitat without destroying existing habitat in other portions of the Bay. Finally, efforts should be undertaken to encourage the growth of the aquaculture fishery as a more permanent solution to the harvest pressure on the wild oyster fishery.Thank you for your consideration,Lani Hummel 901 Bay Ridge RoadAnnapolis, MD 21403

SB 979 - DFA Testimony Senate EHEA Opposition (3-1

Uploaded by: Chip MacLeod

Position: UNF

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Chestertown, Maryland 21620
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FAX: 410-810-1383
www.delmarvafisheries.org

Senate Education, Health, and Environmental Affairs Committee

Testimony in **OPPOSITION** to **Senate Bill 979**

Prohibition on Dredging on Man O'War Shoals

March 16, 2022

The Delmarva Fisheries Association (DFA) urges an **unfavorable** report on Senate Bill 979, as such legislation would indefinitely and arbitrarily prohibit the dredging of much-needed natural oyster shell from an area in the upper Chesapeake Bay know as Man O'War Shoals and contradicts the extensive review and analysis of various State and federal agencies (DNR, MDE, USACE, NOAA, NMFS) over many years in recommending such critical activity in an environmentally sensitive manner to the Board of Public Works. For the General Assembly to declare known deposits of natural oyster shells buried under sedimentation off limits will only add costs and risks to restoration efforts, hurts seafood businesses, fuel contentions among stakeholders in need of shell and, all things considered, makes no sense for the good of the Bay.

Shell matters. (see attachment) Oyster spat need a clean hard surface on which to strike after spawning in order to grow. Chesapeake Bay oyster **shell is the absolute best** surface and material for oyster propagation and growth; and there is an enormous supply of natural shell at Man O'War Shoals. This bill declares a critical natural resource off-limits, buried under Susquehanna River sediments (exacerbated by the Conowingo Factor), where it does no good.

In December 2019, a milestone Resolution signed by Maryland seafood industry leaders, participants and allied businesses was submitted to the Board of Public Works urging affirmative action on the pending DNR application. A copy of the Industry Resolution is attached, showing broad support for oyster shell dredging at Man O'War Shoals, and a history of delay.

DFA is on record in support of dredging natural oyster shell from Man O'War Shoals with the understanding that no dredging will occur in the vicinity of the portion of this natural oyster bar where the Baltimore County Watermen's Association has been engaged in restoration efforts, if any. The shoal is large enough to support the efforts of local oystermen in seed planting and cultivation while permitting the harvesting of natural shell for use throughout the Bay in the commercial fishery and in aquaculture, sanctuaries and hatcheries.

Man O'War Shoals is a relatively isolated natural oyster bar located just to the north of the navigable channel in the Patapsco River in which ships travel to the Ports of Baltimore. The shoal comprises roughly 400 acres and the area designated for the harvesting of shells is approximately 30 acres (~8%). The vast majority of sediments dislodged during the shell harvesting process will settle out in the navigable channel and be dredged by U.S. Army Corps of Engineers (USACE) and the Maryland Port Administration in the course of their channel maintenance program. (See attached DNR Plan Map and Dredge Cut Diagram)

The mud that will be stirred up during the dredging for shell will be a temporary condition and minor compared to other dredging activities by the USACE in the Upper Bay and the enormous amounts of sediment discharged from above Conowingo Dam during storms. The long-term benefits to the natural environment and overall Bay water quality from well-placed indigenous shell obtained from Man O'War Shoals will eclipse any temporary unsettling of the natural environment caused by the shell dredging process. The resulting increase of oysters in the Bay will have a positive economic impact in local jurisdictions and fishing communities – while a natural oyster bar left alone in the upper Bay will eventually, if not already, be smothered by sedimentation and be of little ecological or economic value.

According to DNR's Annual Oyster Surveys from the past several years, Man O'War Shoals is not producing any spat or production-size oysters. In fact, DNR's Oyster Management Review (2016-2020) and its recent evaluation of Maryland's Best Oyster Bars found that **Man O'War Shoals in upper Bay ranked last (232) among natural oyster bars**. A copy of Table C-2 is attached. Pretending that Man O'War Shoals is more deserving of protection for the betterment of oysters or the Bay generally is a distraction when there is indeed universal consensus among stakeholders that real shell is needed and there is a fully vetted permit pending at the Board of Public Works to harvest shell in an environmentally safe manner (amidst all the shipping channel dredging in upper Bay and routine influxes due to the Conowingo factor).

For 40-plus years, the State dredged shell from the upper reaches of the Chesapeake Bay for the oyster replenishment (repletion) program. This program was terminated in 2006 despite very successful results with oyster reproduction and market production of oysters. Since 2006, oysters in the upper reaches of the Chesapeake Bay have almost ceased to exist, other than select areas being planted by watermen's groups. Again, recent DNR Oyster Surveys corroborate this information as well as the work of the Oyster Advisory Commission.

The application for the harvesting of shell from Man O'War Shoals has been pending for longer than can reasonably be justified. The lack of shell breeds fierce competition among stakeholders in the oyster fishery and impedes efforts to maximize the economic and ecological benefits. Because of limited supply, the costs are inflated. The process to gain access to a proven source of natural indigenous shell should be a unifying undertaking – and a priority. This bill does just the opposite.

For these reasons, DFA urges an UNFAVORABLE report on SB 979.

Attachments: DFA and MOW Shoals overview; Letter to Board of Public Works with Industry Resolution; DNR Plan ad Dredge Cuts; DNR Table C-2 (Best Oyster Bars)

CONTACT: Capt. Robert Newberry at 410-708-9851 or rnewberry56@gmail.com
Chip MacLeod at 410-810-1381 or cmacleod@mlg-lawyers.com

DELMARVA FISHERIES ASSOCIATION INC. OVERVIEW

The Delmarva Fisheries Association Inc. (DFA) represents more than 80% of the licensed commercial watermen in the region. It is the largest not for profit organization in the region focused on efforts to ensure the Chesapeake Bay and waters in the Bay's watershed; as well as the historic and unique lifestyle of watermen all survive and thrive. As the livelihoods of watermen depend on a healthy Bay with sustainable harvests, watermen are unsung heroes as environmentalists and as preservationists. Association members of DFA include the Dorchester Seafood Heritage Association, Queen Anne's County Watermen's Association, Kent County Watermen's Association, Talbot County Watermen's Association, and Maryland Clammers Association. DFA is affiliated with the Southeastern Fisheries Association. DFA is a volunteer led organization without a large operating budget, without a large reserve fund, without paid staff, without real estate holdings and without a cadre of advocates in Annapolis. DFA does not solicit donations from the public.

DELMARVA FISHERIES ASSOCIATION KEY MARYLAND INITIATIVES FOR 2022

- Funding for the most cost effective and environmentally sound processes for oyster population restoration and pollution filtering efforts e.g., natural oyster shells dredged from the Man O War Shoal in the Bay for spat seeding programs. **See attached for more details.**
- Greater urgency and commitment to efforts to address pollution from sediment trapped behind the Conowingo Dam and scoured downstream during storm events.
- Greater awareness that recent legal action to address raw sewage discharges from Baltimore area sewage treatment plants needs to acknowledge there have been much larger amounts of pollution discharges prior to the dates and violations cited included in the current lawsuit
- Greater utilization of DFA's experience, expertise, and research findings by all those charged with making policy decisions on all matters related to the Bay and commercial fisheries
- Greater recognition that harvests from wild fisheries provide seafood consumers the freshest and best tasting seafood available anywhere in the world.
- Greater support for expanding wild fisheries and stop efforts to phase out wild fisheries

DELMARVA FISHERIES ASSOCIATION CONTACTS

Board Chair – Captain Rob Newberry – rnewberry56@gmail.com
General Counsel – Chip MacLeod -- cmacleod@mlg-lawyers.com

ATTACHMENT A

REASONS TO IMPLEMENT DFA'S OYSTER RESTORATION INITIATIVE
TO DREDGE OYSTER SHELLS

FROM THE MAN O WAR SHOAL IN THE UPPER CHESAPEAKE BAY

- It is a proven cost effective and an environmentally sound process to restore the Bay's oyster population.

- Hatchery produced spat on shell has **a 95 to 98% MORTALITY rate**.

- Shell that is transplanted and is struck by wild oyster larvae and transplanted back to areas has a **90% SURVIVABILITY rate.**

- The $73-million-dollar investment made in restoration efforts for oysters, comparably, has shown no return financially on the investment, and no significant increase in biomass or recruitment in those areas.

- Commercial watermen of Talbot County invested $1 million over 10 years in Broad Creek alone and have returned more than $18 million on that investment in prudently placed shell.

- The increase in wild oyster harvest by commercial watermen has increased by 200% over the past 3 years; with biomass, recruitment, and spat productions at a 25-year high in public fishery areas. This has consistently increased over the past 3 years, specifically in areas that are being harvested and worked properly.

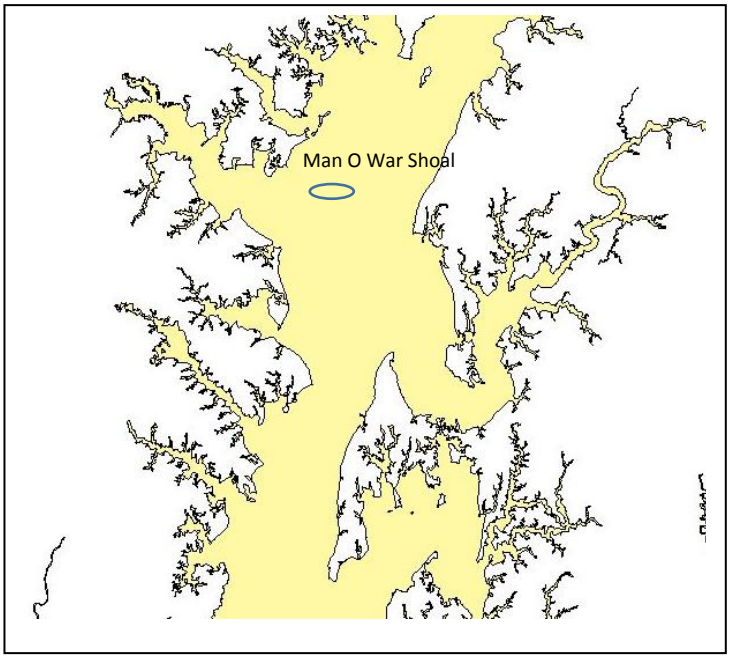
- This initiative will be a giant step toward on even more sustained success on restoring the Bay's oyster population.

Maryland Department of Natural Resources

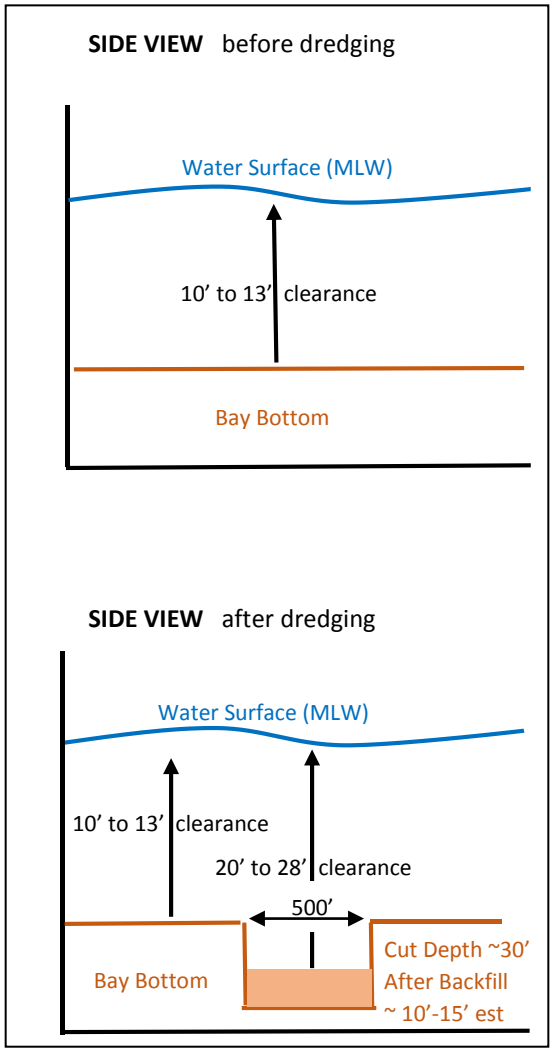
Man O War Shoal
Shell Dredging Permit Application
Plan Map and Dredge Cut Diagram

February 2017

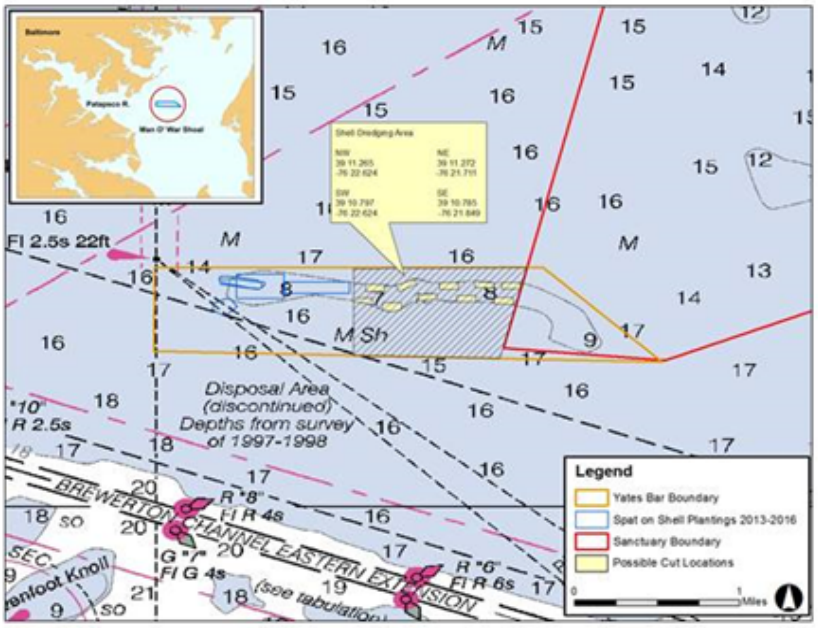
Dredge cut locations are potential, not actual sites. Actual cut sites will be determined before dredging occurs as per conditions in the permit



SIDE VIEW of Dredge Cut



TOP VIEW of Dredge Cuts



- The proposed shell dredging area is the crosshatched area.
- Locations of dredge cuts are conceptual, for illustration purposes.
- Actual locations determined before dredging and according to the permit.
- Cut dimensions will be 500' maximum width and a length no greater than 1/3 of the way into the charted edge of the shoal (average of 275' long).
- Undredged bottom will be left between cuts.
- No greater than 10 cuts will be made to remove the proposed 5 million bushels of shell.

December 6, 2019

Honorable Lawrence J. Hogan, Jr., Governor
Honorable Peter V.R. Franchot, Comptroller
Honorable Nancy K. Kopp, Treasurer
Maryland Board of Public Works
State House
100 State Circle
Annapolis, Maryland 21401-1925

Re: Industry Resolution Requesting Action on DNR Permit Application for Man O'War Shoal Oyster Shell Dredging (Tidal Wetlands Case No. 15-WL-0757)

Dear Governor Hogan, Comptroller Franchot and Treasurer Kopp:

Enclosed please find a milestone Resolution signed by Maryland seafood industry leaders, participants and allied businesses urging the Board of Public Works to take affirmative action on the pending DNR permit application to dredge buried oyster shell at Man O'War Shoal in northern Chesapeake Bay. The Resolution we hope speaks for itself and reflects solidarity in the commercial seafood industry as evidenced by the unified support of Delmarva Fisheries Association, Maryland Watermen's Association, Maryland Oystermen Association and County Oyster Committee and County Watermen Association leaders.

Moreover, this Resolution supplements the previous letters of support from the Maryland Rural Counties Coalition and the Eastern Shore Delegation of the General Assembly for moving forward with oyster shell dredging at Man O'War Shoal, as well as the prior testimony and written comments provided by our organizations and members in full support of this call for action.

A final decision in this regard is long overdue and critical to the work of so many. Natural oyster shell is desperately needed for all aspects of oyster restoration in Maryland – aquaculture, sanctuaries, hatcheries and the commercial/public fishery. There is no dispute among all stakeholders that natural indigenous shell is the absolute best for oyster propagation and growth; and there is an enormous supply in the upper Bay, buried under sediment – where it does no good. Given all the modern-day stressors on the Bay, unmanaged oyster bars become graveyards for the iconic bivalve. The self-imposed shortage of shell is a significant obstacle to getting more oysters in the Bay – a goal we all embrace.

Knowing that Man O'War Shoal is the largest deposit of oyster shell in the State and well-aware of Maryland's successful shell replenishment program that DNR sponsored in cooperation with the commercial seafood industry for more than four decades (a program now

being copied by the Commonwealth of Virginia with much success – and to Maryland's economic detriment), the reasons we hear from the opposition who would rather declare Man O'War Shoal off limits as a source of natural oyster shell are spurious at best.

We respectfully request that DNR's pending application be prioritized as an agenda item for action by the Board of Public Works as soon as possible, and with that an opportunity to be heard. Please act now and give our collective efforts for more oysters in the water the key ingredient – shell.

Very Truly Yours,

Ronald H. Fithian
Chairman, CCC
Kent County Commissioner

Capt. Robert Newberry
Chairman, DFA

Enclosures: Seafood Industry Resolution
Eastern Shore Delegation Letter (8/21/19)
MD Rural Counties Coalition Letter (8/26/19)

cc: Jeannie Haddaway-Riccio, Secretary, DNR
Eastern Shore Delegation
Maryland Rural Counties Coalition
Maryland Watermen's Association
Maryland Oystermen Association
Oyster Advisory Commission

We, the Undersigned, do Hereby Support the Following

RESOLUTION

A Resolution by Members, Allied Businesses and Supporters of the Maryland Seafood Industry urging the Board of Public Works (BPW) to take affirmative action regarding the DNR permit application to dredge buried oyster shell at Man O'War Shoals.

RECITALS

WHEREAS, in 2009 at the request of the Oyster Advisory Commission (OAC), the General Assembly passed HB103 directing DNR to apply for a new shell dredging permit which they did on July 1, 2009 (over a decade ago). From DNR website:

> This site was selected because it has the most significant deposit of buried shell (86 to 103 million bushels, Maryland Geological Survey, personal communications) among the other sites considered and does not occur within a striped bass spawning reach as do other shell deposits…In response to stakeholders' concerns about the potential ecological effects of a shell dredging project of this magnitude, the department requested an initial 5-year permit to dredge about 5 million bushels of shell as part of **a comprehensive monitoring project to assess the ecological consequences of removing shell from the shoal** (emphasis added).

WHEREAS, the following agencies, United States Army Corps of Engineers (USACE), National Oceanic & Atmospheric Administration (NOAA), National Marine Fisheries Service (NMFS), the United States Environmental Protection Agency (EPA), United States Coast Guard (USCG), and Maryland Department of the Environment (MDE), have reviewed, commented and signed off on the current version of the pending permit.

WHEREAS, a cornerstone of DNR's recently adopted Fishery Management Plan for Oysters is the availability of natural shell. This shell is required for sanctuaries, aquaculture and the public fishery. Shell from Man O'War will benefit all three. Had the permit been issued last year following the issuance of the provisional permit by USACE, the recent robust natural spatset witnessed in the lower Bay might not have been lost; both recent surveys and watermen's intimate knowledge of Bay waters reveal areas where natural spatset occurs.

WHEREAS, to address environmental concerns, the permit is limited in scope. **Year 1** will be devoted to the seasonal collection of baseline environmental data on water quality, oyster populations, and fish and benthic communities. **Year 2** will see the removal of approximately 2 million bushels of shell, making four cuts. **Years 2 & 3** will include the collection of further seasonal monitoring data on the metrics described above. By the end of **Year 4**, data will be analyzed and disseminated. **In the event that no significant adverse effects are detected**, in **Year 5** the remaining 3 million bushels will be dredged. ***Any further dredging would require a new permit.*** **The permit allows for the dredging of up to 5 million bushels (of an estimated 86-103 million) over the course of 5 years and includes multiple levels of environmental monitoring. A decade-long delay implanting a proven strategy has had severe adverse impacts on Bay water quality, restoration efforts and the commercial fishery.**

OVER →

WHEREAS, both the Eastern Shore Delegation of the Maryland General Assembly and the Maryland Rural Counties Coalition, by way of letters to Comptroller Franchot, do also support the proposed Man O'War Shoals dredging project.

WHEREAS, the timeline for this project has been drawn out to an exceptional degree and allowed for multiple agencies, organizations and individuals to provide input, plans to be revised and environmental concerns addressed. An abridged timeline follows:

2009 General Assembly of Maryland (GAM) Requests DNR Apply for Permit to Dredge Natural Shell

July 1, 2009 DNR Submits Dredging Application

Interim: Per Request from USACE, DNR Explores Alternative Shell and Non-Shell Substrate Alternatives

July 17, 2015 DNR Re-Submits Dredging Application

September 9, 2015 DNR Applies for Tidal Wetlands License

February 18, 2016 Public Comment on Tidal Wetlands License Closes

February 2017 DNR Re-Submits Dredging Application

October 2017 MDE Releases Wetland Report & Recommendation to BPW Recommending Approval of Tidal Wetlands License

November 1-21, 2017 Additional Public Notice re: Tidal Wetlands License

May 17, 2018 USACE Issues Provisional Permit to DNR for Dredging MOW Shoals

2019 Emergency Bills to Prohibit Dredging at MOW Shoals introduced during GAM Session. Did not make it out of committee.

NOW THEREFORE, BE IT RESOLVED BY THE FOLLOWING MEMBERS, ALLIED BUSINESSES AND SUPPORTERS OF THE MARYLAND SEAFOOD INDUSTRY, that that the Signatories do hereby request that the Board of Public Works takes affirmative action regarding the DNR permit application to dredge buried oyster shell at Man O'War Shoals. It is past time that a decade-old mandate by the General Assembly of Maryland, and the subsequent recommendation of the Maryland Department of Natural Resources, be realized and we finally have a definitive answer on the environmental impact of dredging buried shell, as well as a supply of the preferred substrate (i.e. clean, natural shell) to supplement restoration efforts in sanctuaries, on aquaculture bottom leases and in cages, in hatcheries, and in areas of the public fishery with historically robust natural spatset that currently lack clean, adequate, hard bottom.

ADOPTED and effective by those signatories below in September, October and November 2019.

Signatories Appended Below

BE IT RESOLVED BY THE FOLLOWING MEMBERS, ALLIED BUSINESSES AND SUPPORTERS OF THE MARYLAND SEAFOOD INDUSTRY, that that the Signatories do hereby request that the Board of Public Works takes affirmative action regarding the DNR permit application to dredge buried oyster shell at Man O'War Shoals. It is past time that a decade-old mandate by the General Assembly of Maryland, and the subsequent recommendation of the Maryland Department of Natural Resources, be realized and we finally have a definitive answer on the environmental impact of dredging buried shell, as well as a supply of the preferred substrate (i.e. clean, natural shell) to supplement restoration efforts in sanctuaries, on aquaculture bottom leases and in cages, in hatcheries, and in areas of the public fishery with historically robust natural spatset that currently lack clean, adequate, hard bottom.

Chairman, Delmarva Fisheries Association

NEXT PAGE
President, Maryland Watermen's Association

Chairman, Calvert Oyster Committee

Chairman, Dorchester Oyster Committee

Chairman, Kent Oyster Committee

Chairman, Queen Anne's Oyster Committee
& Oyster Advisory Commissioner

Chairman, Somerset Oyster Committee

Chairman, St. Mary's Oyster Committee

Chairman, Talbot Oyster Committee
& Oyster Advisory Commissioner

Chairman, Wicomico Oyster Committee

Ron Fithian, Oyster Advisory Commissioner

Tom Bradshaw, Oyster Advisory Commissioner

SUBSEQUENT PAGE
Greg Kemp, Talbot Seafood Heritage Assoc.
& Oyster Advisory Commissioner

Jim Mullin, Maryland Oystermen Association
& Oyster Advisory Commissioner

Bobby Whaples, Dorchester Seafood Heritage Association

Jack Brooks, Chesapeake Bay Seafood Industries Association

Chair Anne Arundel Co
Oyster Committee

Charles County Oyster Committee

BE IT RESOLVED BY THE FOLLOWING MEMBERS, ALLIED BUSINESSES AND SUPPORTERS OF THE MARYLAND SEAFOOD INDUSTRY, that that the Signatories do hereby request that the Board of Public Works takes affirmative action regarding the DNR permit application to dredge buried oyster shell at Man O'War Shoals. It is past time that a decade-old mandate by the General Assembly of Maryland, and the subsequent recommendation of the Maryland Department of Natural Resources, be realized and we finally have a definitive answer on the environmental impact of dredging buried shell, as well as a supply of the preferred substrate (i.e. clean, natural shell) to supplement restoration efforts in sanctuaries, on aquaculture bottom leases and in cages, in hatcheries, and in areas of the public fishery with historically robust natural spatset that currently lack clean, adequate, hard bottom.

Chairman, Delmarva Fisheries Association

President, Maryland Watermen's Association & Oyster Advisory Commissioner*

Chairman, Calvert Oyster Committee

Chairman, Dorchester Oyster Committee

Chairman, Kent Oyster Committee

Chairman, Queen Anne's Oyster Committee & Oyster Advisory Commissioner

Chairman, Somerset Oyster Committee

Chairman, St. Mary's Oyster Committee

Chairman, Talbot Oyster Committee & Oyster Advisory Commissioner

Chairman, Wicomico Oyster Committee

Ron Fithian, Oyster Advisory Commissioner

Tom Bradshaw, Oyster Advisory Commissioner

Greg Kemp, Talbot Seafood Heritage Assoc. & Oyster Advisory Commissioner

Jim Mullin, Maryland Oystermen Association & Oyster Advisory Commissioner

Bobby Whaples, Dorchester Seafood Heritage Association

Jack Brooks, Chesapeake Bay Seafood Industries Association

*Oyster Advisory Commissioner = a member of DNR's Oyster Advisory Commission.

BE IT RESOLVED BY THE FOLLOWING MEMBERS, ALLIED BUSINESSES AND SUPPORTERS OF THE MARYLAND SEAFOOD INDUSTRY, that that the Signatories do hereby request that the Board of Public Works takes affirmative action regarding the DNR permit application to dredge buried oyster shell at Man O'War Shoals. It is past time that a decade-old mandate by the General Assembly of Maryland, and the subsequent recommendation of the Maryland Department of Natural Resources, be realized and we finally have a definitive answer on the environmental impact of dredging buried shell, as well as a supply of the preferred substrate (i.e. clean, natural shell) to supplement restoration efforts in sanctuaries, on aquaculture bottom leases and in cages, in hatcheries, and in areas of the public fishery with historically robust natural spatset that currently lack clean, adequate, hard bottom.

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President, Maryland Watermen's Association

Chairman, Calvert Oyster Committee

Chairman, Dorchester Oyster Committee

Chairman, Kent Oyster Committee

Chairman, Queen Anne's Oyster Committee & Oyster Advisory Commissioner

Chairman, Somerset Oyster Committee

Chairman, St. Mary's Oyster Committee

Chairman, Talbot Oyster Committee & Oyster Advisory Commissioner

Chairman, Wicomico Oyster Committee

Ron Fithian, Oyster Advisory Commissioner

Tom Bradshaw, Oyster Advisory Commissioner

Greg Kemp, Talbot Seafood Heritage Assoc. & Oyster Advisory Commissioner

Jim Mullin, Maryland Oystermen Association & Oyster Advisory Commissioner

Bobby Whaples, Dorchester Seafood Heritage Association

Jack Brooks, Chesapeake Bay Seafood Industries Association

Bruce Nooper
KENT COUNTY WATERMAN

BE IT RESOLVED BY THE FOLLOWING MEMBERS, ALLIED BUSINESSES AND SUPPORTERS OF THE MARYLAND SEAFOOD INDUSTRY, that that the Signatories do hereby request that the Board of Public Works takes affirmative action regarding the DNR permit application to dredge buried oyster shell at Man O'War Shoals. It is past time that a decade-old mandate by the General Assembly of Maryland, and the subsequent recommendation of the Maryland Department of Natural Resources, be realized and we finally have a definitive answer on the environmental impact of dredging buried shell, as well as a supply of the preferred substrate (i.e. clean, natural shell) to supplement restoration efforts in sanctuaries, on aquaculture bottom leases and in cages, in hatcheries, and in areas of the public fishery with historically robust natural spatset that currently lack clean, adequate, hard bottom.

Signature
Print Name: Christopher M. Kaufman

Signature
Print Name: KENNETH H PLATT

Signature
Print Name: James Thomas

Signature
Print Name: GEORGE R. LUONGO

Signature
Print Name: George Thomas Sr

Signature
Print Name: Lenell Jones

Signature
Print Name: Albert S. Hampton

Signature
Print Name: Leon Washington

Signature
Print Name: Phil Jewell

Signature
Print Name: W RONALD SMITH

Signature
Print Name: Michael Ruth

Signature
Print Name: Edward Grimes

Signature
Print Name: John W Kettering

Signature
Print Name: Tim Horney

Please return to Delmarva Fisheries Association, 120 Speer Road, Suite 1, Chestertown, MD 21620 by October 4, 2019 so that we may forward in bulk to the Board of Public Works.

BE IT RESOLVED BY THE FOLLOWING MEMBERS, ALLIED BUSINESSES AND SUPPORTERS OF THE MARYLAND SEAFOOD INDUSTRY, that that the Signatories do hereby request that the Board of Public Works takes affirmative action regarding the DNR permit application to dredge buried oyster shell at Man O'War Shoals. It is past time that a decade-old mandate by the General Assembly of Maryland, and the subsequent recommendation of the Maryland Department of Natural Resources, be realized and we finally have a definitive answer on the environmental impact of dredging buried shell, as well as a supply of the preferred substrate (i.e. clean, natural shell) to supplement restoration efforts in sanctuaries, on aquaculture bottom leases and in cages, in hatcheries, and in areas of the public fishery with historically robust natural spatset that currently lack clean, adequate, hard bottom.

Signature
Print Name: Troy Lee

Signature
Print Name: Larry Jones

Signature
Print Name: Rodger McQuay

Signature
Print Name: Terry McQuay

Signature
Print Name: Craig Barnhart

Signature
Print Name: Alvin Richardson II

Signature
Print Name: William Alvin Richardson Sr

Signature
Print Name: Robert E. Haddaway

Signature
Print Name: John J. Dodge

Signature
Print Name: John J Miner

Signature
Print Name: Russ Dwyer

Signature
Print Name: Guy Spurry

Signature
Print Name: Joseph C. Slemp Jr.

Signature
Print Name: Ed Crouch

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Signature
Print Name: Brian C. Williams

Signature
Print Name: Peter W. Lubin

Signature
Print Name: Ronald Swartz

Signature
Print Name: MARC VAN RELT

Signature
Print Name: Bruce Lowery

Signature
Print Name: David R. Miller

Signature
Print Name: William Skipper

Signature
Print Name: Robin G. Harrison

Signature
Print Name: W. Sherman Pickens

Signature
Print Name:

Signature
Print Name:

Signature
Print Name:

Signature
Print Name:

Signature
Print Name:

Signature
Print Name:

Please return to Delmarva Fisheries Association, 120 Speer Road, Suite 1, Chestertown, MD 21620 by October 4, 2019 so that we may forward in bulk to the Board of Public Works.

THE MARYLAND GENERAL ASSEMBLY
ANNAPOLIS, MARYLAND 21401
EASTERN SHORE DELEGATION

August 21, 2019

Honorable Peter V.R. Franchot
Comptroller of Maryland
80 Calvert Street
P.O. Box 466
Annapolis, Maryland 21401-0466

Re: Man O'War Shoals Shell Dredging Permit

Dear Comptroller Franchot:

It has come to our attention that the Board of Public Works is revisiting the plan to utilize buried oyster from Man O'War Shoals in various oyster-related efforts in the Chesapeake Bay after the General Assembly failed to move forward with the prohibition despite vigorous efforts on the part of certain special interest groups during the 2019 session. As members of the Eastern Shore Delegation, we are pleased that spurious talking points that ignore recommendations from career scientists at the Maryland Departments of Natural Resources and the Environment, as well as the U.S. Army Corps of Engineers, developed over nearly a decade of study and analysis, failed to exacerbate the self-imposed shell shortage that has affected restoration efforts for many years.

For the following reasons, the Eastern Shore Delegation supports moving forward with dredging at Man O'War Shoals:

1. Horn Point Hatchery suffered a catastrophic failure in generating spatset this year, **producing 200 times less than last year, and 300 times less than the year before**. At the same time, areas in the lower Bay are producing a bumper crop. Had DNR been able to place shell these places with strong recruitment, they could now be moving them around the Bay to suitable bottom both in and out of the sanctuaries.
2. Man O'War Shoals is a relatively isolated natural oyster bar located just to the north of the navigable channel in the Patapsco River in which ships travel to the Port of Baltimore. The shoal comprises more than 400 acres and the area designated for the harvesting of shells is approximately 30 acres (~7%) over the course of several years and incorporates extensive monitoring components.

3. The vast majority of sediments dislodged during the shell harvesting process will settle out in the navigable channel and be dredged by U.S. Army Corps of Engineers (USACE) and the Maryland Port Administration in the course of their shipping channel maintenance program. The proposed dredge site is not close to the site where Baltimore County watermen have planted oysters and the dredging activity will not have a negative impact on these efforts.
4. According to surveys conducted by MDNR over the preceding eight years, the majority of this bar has no live oysters. Additionally, the volume of fresh water that has entered the Bay from the Susquehanna during the record rainfall in 2018 and 2019 has resulted in high oyster mortality. They are not proposing to dredge in a place that would interfere with active, successful oyster growth.
5. The Eastern Shore Delegation represents constituents who rely on the bounty of the Bay and, in many cases, have done so for generations. In addition to those that work in the seafood and related industries, thousands of tourists flock to our districts each year to enjoy our waterways and activities that have their roots in watermen's culture. We support efforts that support the socio-econmoic success of our residents and honor the rich history that abounds here.
6. Various environmental organizations have repeatedly suggested that construction rubble would serve as a preferable substrate on which baby oysters can grow. Scientific research indicated that Mother Nature's substrate (indigenous shell) is the best for spat and it seems absurd to dump filthy ***rubble*** into the waters of the Chesapeake Bay in an effort to clean it up when there exists hundreds of millions of buried shell to complete the task at hand.
7. For more than 40 years, the State dredged shell from the upper reaches of the Bay for the oyster replenishment program. This program was terminated in 2006 despite very successful results with oyster reproduction, market production of oysters, and 60 million+ in revenue generated for the State. Since 2006, oysters in the upper reaches of the Bay have almost ceased to exist, other than select areas being planted by watermen's groups. Again, recent oyster surveys corroborate this information. In 2009, the General Assembly passed an emergency bill (HB 103) directing the Maryland Department of Natural Resources (DNR) to apply for the permits to dredge buried shells. It's now 2019 and past time for action.

In closing, we urge you to allow this process to finally move forward so we can get to the important work of increasing the iconic oyster in our waters. The delay threatens residents all over the Bay watershed, not just those on the Eastern Shore.

Sincerely,

Steven J. Arentz, Chairman
Eastern Shore Delegation

August 26, 2019

Honorable Peter V.R. Franchot
Comptroller of Maryland
80 Calvert Street
P.O. Box 466
Annapolis, Maryland 21401-0466

Re: Man O'War Shoals Shell Dredging Permit

Dear Comptroller Franchot:

It has come to our attention that the Board of Public Works is revisiting the permit to utilize buried oyster from Man O'War Shoals in various oyster-related efforts in the Chesapeake Bay after the General Assembly failed to move forward with the prohibition despite vigorous efforts on the part of certain special interest groups during the 2019 session. As members of the Maryland Rural County Coalition, we are pleased that spurious talking points that ignore recommendations from career scientists at the Maryland Departments of Natural Resources and the Environment, as well as the U.S. Army Corps of Engineers, developed over nearly a decade of study and analysis, failed to exacerbate the self-imposed shell shortage that has affected restoration efforts for many years.

For the following reasons, the Maryland Rural County Coalition supports moving forward with shell dredging at Man O'War Shoals:

1. Horn Point Hatchery suffered a catastrophic failure in generating spatset this year, **producing 200 times less than last year, and 300 times less than the year before**. At the same time, areas in the lower Bay are producing a bumper crop. Had DNR been able to place shell these places with strong recruitment, they could now be moving them around the Bay to suitable bottom both in and out of the sanctuaries.
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In closing, we urge you to allow this process to finally move forward so we can get to the important work of increasing the iconic oyster in our waters. The delay threatens residents and businesses all over the Bay watershed, not just those in rural counties.

Sincerely,

Jack Wilson

Jack Wilson, RCC Chairman
Queen Anne's County

Table C-2. Oyster bars in the Maryland portion of Chesapeake Bay that have not been planted with wild seed or hatchery seed, 2009-2018 by overall rank. N is the total number of samples for the bar, Site Count is the number of individual sites (not all sites were sampled every year) and the Sanctuary column indicates if the bar is in a sanctuary and when the sanctuary was established. The final column is the number of times the bar was ranked in the top 10% for live oysters (markets and small). The top 10 percent are highlighted in bold; rank 1 to 23. These are the 'natural best bars' for this study.

*Sanctuary status is determined by the location of the Fall Survey site.

[1]A portion of this bar is in a sanctuary.

[2] A portion of this bar is outside the sanctuary.

Overall Rank	Bar Name	Region	N	Site Count	Sanctuary*	# of Years in top 10%
1	**Deep Neck**	**Broad Creek**	**21**	**4**	**No**	**8**
2	**Great Bar**	**Broad Creek**	**23**	**3**	**No**	**6**
3	**Drum Point**	**Manokin River**	**10**	**1**	**Yes (2010)[2]**	**6**
4	**Great Marsh**	**Harris Creek**	**10**	**1**	**No**	**6**
5	**Mulberry Point**	**Broad Creek**	**17**	**3**	**No**	**6**
6	**Willeys Island Flats**	**Broad Creek**	**20**	**2**	**No**	**5**
7	**Pagan**	**St. Marys River**	**10**	**1**	**Yes (2010)**	**7**
8	**Back Cove**	**Tangier Sound**	**16**	**7**	**No**	**6**
9	**Tilghman Wharf**	**Harris Creek**	**10**	**1**	**No[1]**	**5**
10	**Brown**	**Broad Creek**	**14**	**2**	**No**	**5**
11	**Horseshoe**	**St. Marys River**	**10**	**1**	**Yes (2010)**	**6**
12	**Georges**	**Manokin River**	**10**	**1**	**Yes (2010)**	**2**
13	**Ware Rock**	**Pocomoke Sound**	**10**	**1**	**No**	**2**
14	**Mine Creek**	**Manokin River**	**10**	**1**	**Yes (2010)[2]**	**2**
15	**Gunby**	**Pocomoke Sound**	**20**	**2**	**No**	**1**
16	**Punch Island Creek**	**Lower Bay East**	**10**	**1**	**No**	**2**
17	**Evans**	**Fishing Bay**	**13**	**2**	**No**	**2**
18	**Irish Creek**	**Choptank River**	**10**	**1**	**No**	**2**
19	**Lakes Cove**	**Honga River**	**10**	**1**	**No**	**2**

Overall Rank	Bar Name	Region	N	Site Count	Sanctuary*	# of Years in top 10%
20	**Piney Island Swash**	**Manokin River**	**10**	**1**	**Yes (2010)**	**1**
21	**Royston**	**Broad Creek**	**20**	**2**	**No**	**2**
22	**Old Rocks**	**Pocomoke Sound**	**10**	**1**	**No**	**2**
23	**Terrapin Sands Inner**	**Tangier Sound**	**15**	**2**	**No**	**2**
24	Marshy Island	Manokin River	20	2	Yes (2010)[2]	2
25	Great Shoal	Wicomico River East	10	1	No	2
26	Coppage	St. Marys River	10	1	No	2
27	Hill	Fishing Bay	10	1	No	3
28	Wild Cherry Tree	Harris Creek	21	3	No	3
29	Town	Little Choptank River	17	2	Yes (2010)	0
30	McKeils Point	Little Choptank River	8	1	Yes (2010)	2
31	Light House	Honga River	10	1	Yes (pre-2010)	2
32	Norman Add 1	Honga River	10	1	No	1
33	Butterpot	Little Choptank River	9	1	Yes (2010)	0
34	Smoke Point	Honga River	10	1	No	1
35	Mud Rock	Tangier Sound	10	1	No	2
36	Goose Creek	Fishing Bay	11	2	No	4
37	Bean Shoal	Nanticoke River	10	1	Yes (2010)	2
38	Haines	Tangier Sound	14	2	No	1
39	Harris	Tangier Sound	10	1	No	3
40	Crab Point	Honga River	10	1	No	2
41	Old House	Fishing Bay	10	1	No	2
42	Holland Straits East	Lower Bay East	10	1	No	1
43	Peanut Hill	Little Choptank River	10	1	No	0
44	Cherry Tree	Nanticoke River	10	1	Yes (2010)	1
45	Marumsco	Pocomoke Sound	10	1	No	1
46	Point Lookout	Lower Bay West	22	3	No	2

Overall Rank	Bar Name	Region	N	Site Count	Sanctuary*	# of Years in top 10%
47	Grapevine	Little Choptank River	10	1	Yes (2010)	1
48	Clay Island	Fishing Bay	10	1	No	1
49	Sharkfin Shoal	Tangier Sound	14	2	No	1
50	Hawks Nest	Patuxent River	6	1	No	0
51	Halls Point	Wicomico River East	6	2	No	0
52	Hickory Nut	Nanticoke River	10	1	Yes (2010)	0
53	France	Choptank River	10	1	No	1
54	Northwest Middleground	Lower Bay East	20	2	Yes (2010)	1
55	Little Choptank	Little Choptank River	10	1	No	1
56	Cherry	St. Marys River	10	1	No	2
57	Susquehanna	Little Choptank River	9	1	No	2
58	Tedious Creek	Fishing Bay	10	1	No	2
59	Gravelly Run	St. Marys River	20	2	No	1
60	Ragged Point	Little Choptank River	20	2	No	0
61	Wilson Shoals	Nanticoke River	7	2	Yes (2010)	1
62	Old Womans Patch	Nanticoke River	10	1	Yes (2010)	0
63	Taylor Point	Honga River	7	1	No	1
64	Cason	Little Choptank River	10	1	Yes (2010)	0
65	Kent Point	Mid-Bay East	10	1	No	0
66	Cedar Shoal	Nanticoke River	10	1	Yes (2010)	1
67	Calvert Bay	Smith Creek	10	1	No	0
68	Chicken Cock	St. Marys River	6	1	No	1
69	Flat Rock	Pocomoke Sound	10	1	No	1
70	Butler	Lower Bay West	10	1	No	0
71	Stone	Mid-Bay East	10	1	No	0
72	Duck Island	Fishing Bay	10	1	No	3
73	Lighthouse	Choptank River	20	2	No	0

Overall Rank	Bar Name	Region	N	Site Count	Sanctuary*	# of Years in top 10%
74	Roaring Point East	Nanticoke River	10	1	Yes (2010)	0
75	Broome Island	Patuxent River	13	2	No	0
76	Applegarth	Honga River	9	1	Yes (pre-2010)	1
77	Point Lookout Sanctuary	Lower Bay West	13	2	Yes (pre-2010)	2
78	Beacons	Choptank River	10	1	No	1
79	Hambrooks	Choptank River	10	1	No	0
80	Pecks Point	Tred Avon River	8	1	Yes (2010)[2]	0
81	Wetipquin	Nanticoke River	10	1	Yes (2010)	0
82	Pattison	Little Choptank River	10	1	Yes (2010)	0
83	Stone Church	Tred Avon River	10	1	No	0
84	Bachelor Point	Tred Avon River	9	1	No	0
85	Hellen	Patuxent River	10	1	No	0
86	Chlora Point	Choptank River	10	1	Yes (2010)[2]	0
87	Smith Creek	Smith Creek	10	1	No	0
88	Hungerford Hollow	Patuxent River	10	1	No	0
89	Cedar Point Hollow	Lower Bay West	10	1	No[1]	0
90	Dixon	Choptank River	10	1	Yes (2010)	0
91	Rocky Beach	Lower Bay West	9	1	No	0
92	St. George Island	Potomac River Northshore	10	1	No	0
93	Turtle Egg Island	Tangier Sound	20	2	No	0
94	Mares Point	Tred Avon River	10	1	Yes (2010)	0
95	Kitts	Potomac River Northshore	10	1	No	0
96	Windmill	Honga River	10	1	No	0
97	Piney Island East Add 1	Tangier Sound	30	3	Yes (pre-2010)	0
98	Cook Point	Choptank River	14	2	Yes (2010)	0
99	Howells Point Add 2	Choptank River	10	1	No	1
100	Jones	Potomac River Northshore	22	3	No	0

Overall Rank	Bar Name	Region	N	Site Count	Sanctuary*	# of Years in top 10%
101	Chain Shoal	Tangier Sound	10	1	No	0
102	Broad Neck	Patuxent River	7	1	Yes (2010)	0
103	Big Annemessex	Big Annemessex River	9	1	No	0
104	Howells Point	Choptank River	10	2	No	0
105	Susquehanna- Sanctuary	Little Choptank River	7	1	Yes (2010)	0
106	Double Mills	Tred Avon River	10	1	Yes (2010)	0
107	Town Point	Tred Avon River	7	1	No	0
108	Piney Island West	Tangier Sound	20	2	No	0
109	Johnson Island	Eastern Bay	8	2	No	1
110	Cornfield Harbor	Potomac River Northshore	10	1	No	0
111	Mussel Hole	Tangier Sound	10	1	No	0
112	Tanners Patch	Choptank River	10	1	Yes (pre-2010)	0
113	Piney Island East	Tangier Sound	20	3	No	0
114	Louis Cove	Tred Avon River	7	1	Yes (2010)	0
115	Oyster Shell Point	Choptank River	9	2	Yes (2010)	0
116	Evans	Wicomico River East	15	2	No	0
117	Turtle Back	Miles River	10	1	No	0
118	Mill Dam	Choptank River	6	1	Yes (2010)	0
119	Mount Vernon Wharf	Wicomico River East	10	2	No	1
120	Sandy Hill	Choptank River	10	1	Yes (pre-2010)	0
121	Holland Point	Patuxent River	6	1	Yes (2010)	0
122	Brick House	Mid-Bay East	10	1	No	0
123	Dickinson	Choptank River	7	1	No	0
124	Broad Creek	Mid-Bay East	10	1	No[1]	0
125	Drum Point	Chester River	6	1	Yes (2010)	0
126	Hog Island	Lower Bay West	12	3	No	0
127	Poplar Island	Mid-Bay East	20	2	No	0

Overall Rank	Bar Name	Region	N	Site Count	Sanctuary*	# of Years in top 10%
128	Coffee	Miles River	10	1	No	0
129	Great Rock	Tangier Sound	26	3	No	1
130	Bugby	Eastern Bay	39	5	No	0
131	Lows Point	Eastern Bay	10	1	No	0
132	Hurdle	Potomac River Northshore	9	1	No	0
133	Orem	Tred Avon River	10	1	Yes (2010)	0
134	Wild Ground	Eastern Bay	10	1	No	0
135	Thomas	Patuxent River	10	1	Yes (2010)	0
136	Milbourne Shore	Potomac River Northshore	10	1	No	0
137	Wild Ground	Miles River	10	1	No	0
138	Middleground	Nanticoke River	10	1	No	0
139	Herring Island	Miles River	10	1	No	0
140	Flag Pond	Lower Bay West	10	1	Yes (2010)	0
141	Swan Reef	South River	10	1	No	0
142	Mill Hill	Eastern Bay	10	1	No	0
143	Pascahanna	Potomac River Northshore	15	2	No	0
144	Drum Point	Choptank River	10	1	Yes (pre-2010)	0
145	Persimmon Tree	Miles River	10	1	No	0
146	Bramleigh Creek	Wicomico River West	6	1	No	0
147	Sycamore	Miles River	10	1	No	0
148	Bald Eagle Add 3	Eastern Bay	10	1	No	0
149	Blue Sow	Breton/St. Clements Bays	10	1	No[1]	0
150	Shell Hill	Mid-Bay East	10	1	No	0
151	The Black Buoy	Choptank River	7	1	Yes (2010)	0
152	Love Point	Upper Bay East	10	1	Yes (2010)[2]	0
153	Hollicutts Noose	Eastern Bay	11	2	No	0
154	Kingcopsico	Potomac River Southshore	10	1	No	0

Overall Rank	Bar Name	Region	N	Site Count	Sanctuary*	# of Years in top 10%
155	Bodkin Shoals	Eastern Bay	30	3	No	0
156	Turkey Point	Eastern Bay	10	1	No	0
157	Bald Eagle Add 2	Eastern Bay	10	1	No	0
158	Tall Timbers	Potomac River Northshore	10	1	No	0
159	Mills	Wye River	10	1	Yes (2010)	0
160	Nine Foot Knoll	Upper Bay West	10	1	No	0
161	Tolly Point	Mid-Bay West	8	2	No[1]	0
162	Ragged Point	Potomac River Southshore	10	1	No	0
163	Shoal Creek	Choptank River	20	2	Yes (2010)	0
164	Hackett Point	Mid-Bay West	10	1	No	0
165	Ringold Middleground	Eastern Bay	10	1	No[1]	0
166	Slaughter Creek	Little Choptank River	10	1	No	0
167	Cabin Creek	Choptank River	10	1	Yes (pre-2010)	0
168	Normans Fine Eyes	Eastern Bay	10	1	No	0
169	Maxmore Add 1	Tred Avon River	10	1	Yes (2010)	0
170	Mills West	Wicomico River West	10	1	No	0
171	Ash Craft	Miles River	10	1	No	0
172	Cohouck	Wicomico River West	9	1	No	0
173	Sandy Point South	Upper Bay West	13	2	No	0
174	Beacon	Potomac River Northshore	10	1	No	0
175	Gum	Potomac River Southshore	8	2	No	0
176	Parsons Island	Eastern Bay	11	2	No	0
177	Wickes Beach	Chester River	7	1	Yes (2010)	0
178	Seven Foot Knoll	Upper Bay West	10	1	No	0
179	Whetstone	Wye River	10	1	Yes (2010)	0
180	Cobb Island	Potomac River Northshore	7	1	No	0
181	Heron Island	Potomac River Northshore	10	1	No	0

Overall Rank	Bar Name	Region	N	Site Count	Sanctuary*	# of Years in top 10%
182	Walter White	Eastern Bay	8	1	No	0
183	Coots	Mid-Bay West	12	2	No	0
184	Tolchester Lump	Upper Bay East	10	1	No	0
185	Southeast Middleground	Patuxent River	10	1	No	0
186	Purdy Flats	South River	10	1	No	0
187	Lancaster	Wicomico River West	7	1	No	0
188	Bruffs Island	Wye River	10	1	Yes (2010)	0
189	Lower Cedar Point	Potomac River Northshore	19	2	No	0
190	Lumps East of Craighill Channel	Upper Bay West	20	2	No	0
191	Green Marsh	Choptank River	10	1	Yes (2010)	0
192	Buzzard Island	Patuxent River	10	1	Yes (2010)	0
193	Deep Shoal	Upper Bay East	10	1	No	0
194	Second Point	Miles River	10	1	No	0
195	Popes Creek	Potomac River Northshore	10	1	No	0
196	Terrapin Sands Add 1	Tangier Sound	16	2	No	0
197	West End	Miles River	5	1	No	0
198	Ebb Point	Chester River	10	1	Yes (2010)	0
199	Buoy Rock	Chester River	10	1	No[1]	0
200	Horse Race	Chester River	11	2	No	0
201	Piney Point	Chester River	14	2	No	0
202	Manahowic Creek	Wicomico River West	9	1	No	0
203	Race Horse	Wye River	10	1	Yes (2010)	0
204	Well Cove	Eastern Bay	7	1	No	0
205	Hodges	Upper Bay East	10	1	No	0
206	Mountain Point	Upper Bay West	6	1	No	0
207	Chinks Point	Severn River	10	2	Yes (pre-2010)	0
208	Old Field	Chester River	7	1	Yes (2010)[2]	0

Overall Rank	Bar Name	Region	N	Site Count	Sanctuary*	# of Years in top 10%
209	Strong Bay	Chester River	18	2	Yes (pre-2010)	0
210	Spaniard Point	Chester River	7	1	Yes (2010)	0
211	Durdin	Chester River	10	2	No	0
212	Black Walnut	Breton/St. Clements Bays	10	1	Yes (2010)	0
213	Wye River Middleground	Wye River	10	1	Yes (2010)	0
214	Boathouse	Chester River	8	1	Yes (2010)	0
215	Sheepshead Bay	Potomac River Northshore	9	1	No	0
216	Sheep	Chester River	10	1	Yes (pre-2010)	0
217	Sixfoot Knoll	Upper Bay West	5	1	No	0
218	Rock Point	Wicomico River West	5	1	No	0
219	Long Point	Miles River	10	1	Yes (2010)	0
220	Old Womans Leg	Tangier Sound	10	1	No	0
221	Shippen Creek	Chester River	10	1	Yes (pre-2010)	0
222	Emory Hollow	Chester River	10	1	Yes (2010)	0
223	Swan Point	Upper Bay East	9	1	No[1]	0
224	Coal Lump	Upper Bay West	10	1	No	0
225	White Point	Wicomico River West	5	1	No	0
226	Swan Point	Potomac River Northshore	13	2	No	0
227	Bluff Point	Chester River	10	1	No[1]	0
228	Cliff	Chester River	10	1	Yes (2010)	0
229	Mouth Of River	Wicomico River West	8	1	No	0
230	Flat Rock	Upper Bay East	10	1	No	0
231	Holland Point	Mid-Bay West	10	1	Yes (2010)	0
232	Man O' War Shoals	Upper Bay West	10	1	No[1]	0

ManOWarShell.pdf
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Position: UNF

See page 9 Shell efficacy for restoration.

2020 Maryland Oyster Monitoring Report

Analysis of Data from the '10 Tributaries' Sanctuary Oyster Restoration Initiative in Maryland

Data collected from October 2020 through January 2021

Produced in partnership with the Maryland Oyster Restoration Interagency Workgroup of the Chesapeake Bay Program's Sustainable Fisheries Goal Implementation Team

Table of Contents

This report, past monitoring reports, tributary-specific oyster restoration plans ('blueprints'), and other oyster restoration technical documents produced by the Maryland Oyster Restoration Interagency Workgroup of the Chesapeake Bay Program's Sustainable Fisheries Goal Implementation Team are available at https://www.chesapeakebay.net/who/publications-archive/maryland_and_virginia_oyster_restoration_interagency_teams.

Please cite this document as: Maryland Oyster Restoration Interagency Workgroup under the Chesapeake Bay Program's Sustainable Fisheries Goal Implementation Team. 2020 Oyster Reef Monitoring Report: Analysis of Data from the 'Ten Tributaries' Sanctuary Oyster Restoration Initiative in Maryland. 2021.

Executive Summary

Context for This Report

- The 2014 Chesapeake Bay Watershed Agreement[1] includes a goal to restore oyster populations in 10 Chesapeake Bay tributaries by 2025 (hereafter, the 10 tributaries initiative').
- In Maryland, partners including the National Oceanic and Atmospheric Administration (NOAA), U.S. Army Corps of Engineers' Baltimore District (USACE), Oyster Recovery Partnership (ORP), and the Maryland Department of Natural Resources (DNR) are working to achieve this goal through the Maryland Interagency Oyster Restoration Workgroup (hereafter, the Workgroup). The Workgroup is convened under the Sustainable Fisheries Goal Implementation Team of the Chesapeake Bay Program and is chaired by Stephanie Reynolds Westby (NOAA).
- A set of oyster restoration success criteria, commonly known as the Chesapeake Bay Oyster Metrics[2], was developed prior to implementing restoration work in the 10 tributaries. In past years, the annual versions of this report described the success of each reef monitored relative to the six Oyster Metrics success criteria: oyster density, oyster biomass, multiple year classes, shell budget, reef height, and reef footprint. However, COVID-related restrictions in 2020 and 2021 prohibited data collection on reef height and reef footprint parameters. These data will be collected in fall 2021 to ensure a complete data set, where possible. This report therefore describes reef success relative to the four success criteria for which data was collected: oyster density, oyster biomass, multiple year classes, and shell budget.
- Restored reefs are monitored three years and again six years after initial restoration. A subset of reefs in Harris Creek, Little Choptank River, and Tred Avon River are now either three or six years old, and were due for monitoring in fall 2020.
- Trends observed in previous monitoring years generally continued in 2020, with the wide majority of restored reefs meeting all Oyster Metrics success criteria for which they were monitored.
- Data and analyses in this report can be used by restoration partners to help inform what adaptive management measures, if any, should be taken on each of the monitored reefs. Results may also guide restoration in other tributaries.

Key Fall 2020 Monitoring Results

- In fall 2020, 40 three-year-old restored reefs (103 acres) were monitored in the Little Choptank and Tred Avon rivers combined, and 27 six-year-old restored reefs (119 acres) were monitored in Harris Creek and Little Choptank River combined.
- Overall, the vast majority of reefs monitored in fall 2020 met the Oyster Metrics success criteria.
    - Oyster density: 98% of three-year-old reefs and 100% of six-year-old reefs, met the minimum threshold criteria (see Figure 1).
    - Oyster biomass: Results for this criteria tracked closely with oyster density (see Figure 5).
    - Multiple year class and shell budget: 100% of reefs met these criteria (see Table 3).
    - Reef height and reef footprint: These criteria were not monitored in fall 2020 due to COVID-related restrictions on vessel operations.

- See Section 3.1: Summary of Fall 2020 Monitoring Results, and Appendix A: Table of Summary Data by Reef, for more complete results information.

Key Cumulative Monitoring Results 2015-2020

- From fall 2015 through fall 2020, 203 three-year-old restored reefs (711 acres) were monitored in Harris Creek, Little Choptank River, and Tred Avon River combined, and 70 six-year-old restored reefs (310 acres) were monitored in Harris Creek and Little Choptank River combined.
- The vast majority of reefs monitored during this period met all of the minimum Oyster Metrics success criteria.
    - Oyster density: 96% of three-year-old reefs and 99% of six-year-old reefs, met the minimum threshold criteria (see Figure 1).
    - Oyster biomass: Results for this criteria tracked closely with oyster density throughout the period (see Figure 5).
    - Multiple year classes and shell budget: 100% of reefs met these criteria (see Table 3).
    - Reef height and footprint: 100% of reefs monitored for these parameters met the success criteria.
- See Section Section 3.2: Summary of Cumulative Results, 2015-2020 for more complete results information.

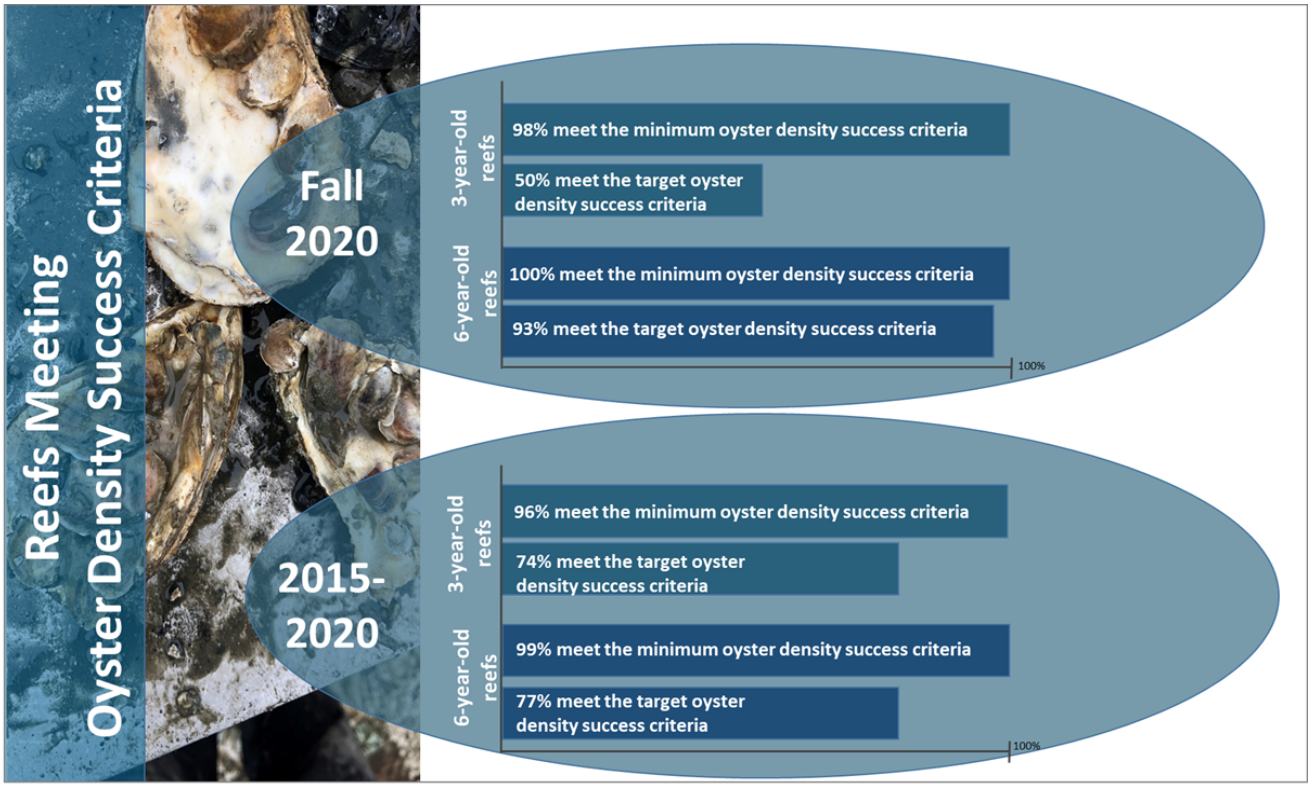

Figure 1: *Graphic showing reefs meeting the oyster density success criteria in 2020 and 2015-2020 (cumulative). Oyster biomass followed a similar trend (see Figure 5).*

Section 1: Background and Overview

1.1: Policy Drivers, Oyster Metrics Success Criteria, and Oyster Restoration Planning

The 2014 Chesapeake Bay Watershed Agreement[1] oyster outcome calls for restoring oyster populations in 10 Chesapeake Bay tributaries by 2025. The Chesapeake Bay Program's Sustainable Fisheries Goal Implementation Team (Fisheries GIT) is charged with working to achieve this goal. Driven by Executive Order 13508 (Chesapeake Bay Protection and Restoration) of 2009, some work toward tributary-scale oyster restoration was under way even before the Chesapeake Bay Watershed Agreement was signed. The Fisheries GIT had convened the Chesapeake Bay Oyster Metrics Workgroup, which, in its 2011 report "Restoration Goals, Quantitative Metrics and Assessment Protocols for Evaluating Success on Restored Oyster Reef Sanctuaries,"[2] (hereafter, 'Oyster Metrics') established Bay-wide, science-based, consensus success criteria for oyster restoration to be tracked three years and six years following restoration efforts (Table 1).

Once these success criteria were adopted, the Fisheries GIT convened interagency workgroups in Maryland and Virginia to plan and coordinate restoration work in each state. In Maryland, the Maryland Oyster Restoration Interagency Workgroup (hereafter, 'the Workgroup') is chaired by the National Oceanic and Atmospheric Administration (NOAA) and includes members from the Maryland Department of Natural Resources (DNR), Oyster Recovery Partnership (ORP), and the U.S. Army Corps of Engineers' Baltimore District (USACE). The Workgroup developed oyster restoration tributary plans (also known as "blueprints") for Harris Creek[3], Little Choptank River[4], Tred Avon River[5], upper St. Marys River[6], and Manokin River[7] in consultation with a group of consulting scientists and the public.

Biological Metrics	Oyster density	Minimum threshold = 15 oysters per m^2 over 30% of the reef area. Target = 50 oysters per m^2 over 30% of the reef area.
	Oyster biomass	Minimum threshold = 15 grams dry weight per m^2 over 30% of the reef area. Target = 50 grams dry weight per m^2 over 30% of the reef area.
	Multiple year classes	Presence of multiple year classes on the reef, as defined by oysters in at least two of the following size classes: market (>76 mm); small (40-75 mm); spat (<40 mm).
	Shell budget	Stable or increasing shell volume on the reef.
Structural Metrics	Reef footprint	Stable or increasing reef footprint compared to baseline.
	Reef height	Stable or increasing reef height compared to baseline.

Table 1: *Oyster Metrics reef-level success criteria. Note that in fall 2020, reef height and reef structure were not monitored due to COVID-related restrictions on vessel operations.*

1.2: Overview of Report Content

Restored reefs are monitored at three and six years per Oyster Metrics recommendations and each river's tributary plan. Restored reefs in Harris Creek, Little Choptank River, and Tred Avon River have matured to three or six years, and therefore were monitored in October 2020 through January 2021 (referred to as the 'fall 2020' monitoring cycle). Data and analysis for these reefs, plus reference reefs (controls that received no restoration action) and sentinel reefs (restored sites that are monitored annually) are included in this report. Data summaries for each reef individually are in Appendix A: Table of Summary Data by Reef. This report describes success relative to four of the six Oyster Metrics criteria (oyster density, oyster biomass, multiple year classes, and shell budget). Data relating to the remaining two success criteria (reef height and reef footprint) were not collected in fall 2020 due to COVID-related restrictions on vessel operations. Past monitoring reports are available from the Chesapeake Bay Program's Maryland and Virginia Oyster Restoration Interagency Teams Publications page.

In addition to Oyster Metrics success criteria monitoring, oyster disease data is also collected by DNR, and is available in DNR's annual Fall Survey Report.

1.3: Funding and Acknowledgements

- Monitoring data for the biological success metrics (oyster density, oyster biomass, multiple year classes, and shell budget) were collected, managed, and analyzed by ORP, Coastal Marine Sciences Inc., and contracted commercial watermen, with assistance from Workgroup partners. This was accomplished with funding from:
    - A $130,000 award from NOAA to ORP, and
    - A $124,183 programmatic agreement from USACE to ORP.
- This report was drafted by NOAA, with guidance from the Workgroup. Results of these analyses will be used to document the success or failure of restoration work relative to the Oyster Metrics criteria, to guide adaptive management of these reefs, and to inform future oyster restoration efforts. Technical review of this report was provided by technical experts and Workgroup members, per NOAA research communications guidelines.

Section 2: Overview of Methods and Revised Protocols for 2020

2.1: Location of Monitored Reefs

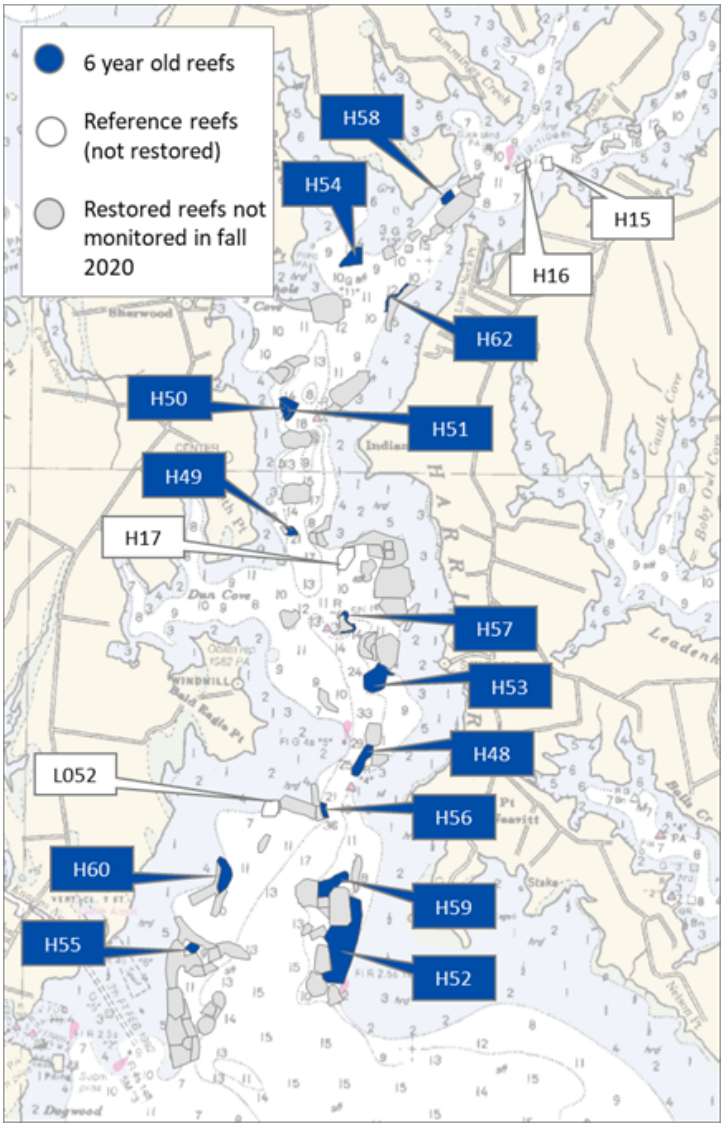

Figure 2: *Locations of Harris Creek reefs monitored in fall 2020. 14 six-year-old reefs were monitored in fall 2020. (Three-year monitoring is complete on all reefs.)*

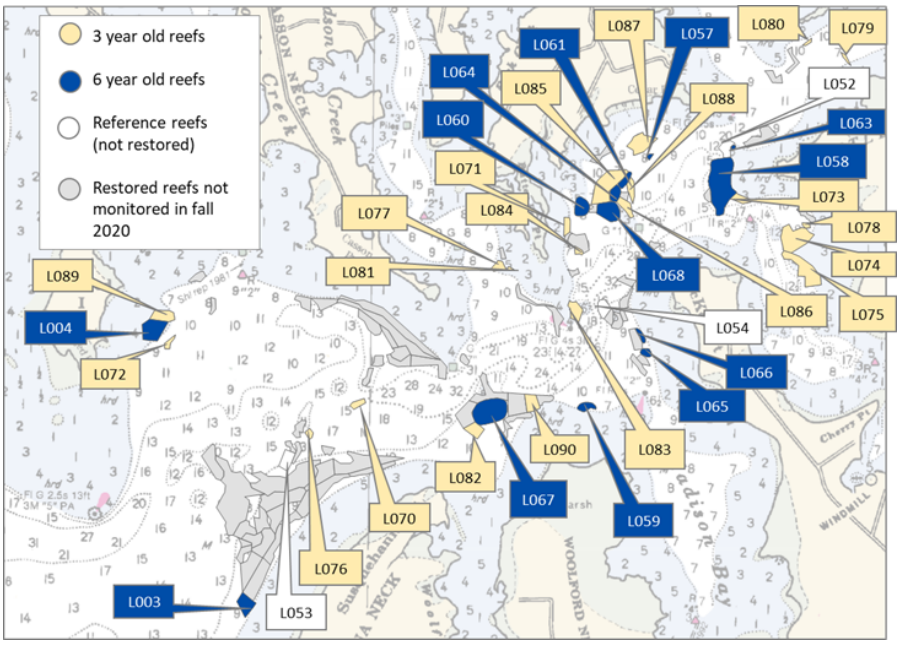

Figure 3: *Locations of Little Choptank River reefs monitored in fall 2020. 21 three-year-old reefs and 13 six-year-old reefs were monitored.*

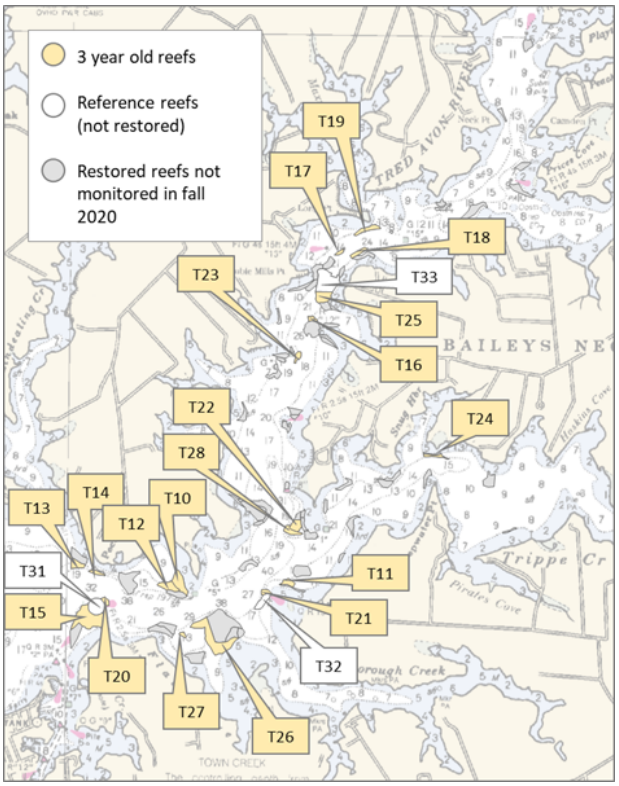

Figure 4: *Locations of the Tred Avon River reefs monitored in fall 2020. 19 three-year-old reefs were monitored. No restored Tred Avon River reefs have yet matured to six years.*

2.2: Methods Summary

See Appendix C for full methods description.

Data to determine success relative to the four biological metrics (oyster density, oyster biomass, multiple year classes, and shell volume) were collected at the same time, using a stratified random survey design. Methods used to select sampling sites, analyze samples, and assess success relative to each biological were identical for all reefs. Data collection occurred between October 2020 and January 2021.

As in previous years, two different types of gear were used to collect samples, depending on reef substrate type:

- Divers were used to collect samples from reefs with substrate materials that were not amenable to patent tong sampling (stone and fossil shell substrate reefs).
- Patent tongs were used to collect samples from all other reef types (seed only, mixed-shell base, reference, and premet reefs) because it is more cost efficient than using divers.
- See Table 2 for description of the various treatment types, and the gear used to monitor the biological metrics on each.

Previous field comparisons[8] on natural oyster reefs revealed no difference in sampling efficiency between oyster densities estimated using divers and those estimated using patent tongs. A similar field comparison on restored reefs in Harris Creek[9] showed that densities estimated using patent tongs resulted in statistically significantly smaller numbers of oysters than those estimated using divers. In that study[9], the densities estimated by divers were 3.35 times higher than those from hydraulic patent tongs, on average. Monitoring results in this report show oyster densities and biomass relative to the established Oyster Metrics benchmarks (e.g., minimum threshold oyster density of 15 oysters per m^2 to be considered successful). Because two different gear types were used for sampling, and results of research[8,9] on the relative sampling efficiencies of those gears vary, it may not be appropriate to use data in this report to compare relative efficacy among reef treatment types.

For both diver and patent tong data, oyster density and oyster biomass information were standardized based on area sampled. Data was then analyzed to determine success relative to each oyster metric success criteria, per the full protocols detailed in Appendix C.

Treatment Type	Reef-building substrate added?	Substrate Material	Cap Material	Reef initially seeded?	Gear type used to collect biological metrics data
Seed Only	No	None	None	Yes (spat-on-shell)	Patent tongs
Mixed shell	Yes	Mixed shell (clam, conch, and whelk)	None	Yes (spat-on-shell)	Patent tongs
Fossil shell	Yes	Fossil shell	None	Yes (spat-on-shell)	Divers
Oyster gardening reef	No	None	None	Yes (adult oysters)	Patent tongs
Stone	Yes	Amphibolite (stone)	None	Yes (spat-on-shell)	Divers
Stone topped with mixed shell	Yes	Amphibolite (stone)	Mixed shell (clam, conch, and whelk)	Yes (spat-on-shell)	Divers
Stone topped with fossil shell	Yes	Amphibolite (stone)	Fossil shell	Yes (spat-on-shell)	Divers
Reference	No	None	None	No	Patent tongs
Premet	No	None	None	No	Patent tongs

Table 2: *Description of treatments used to restore reefs in Harris Creek, Little Choptank River, and Tred Avon River. Also listed is the gear type used to monitor each reef treatment type for the biological metrics (oyster density, oyster biomass, multiple year classes, and shell volume). See Section 4: Definitions for full definitions.*

2.3: Revised Protocols for 2020

Overall protocols have remained largely consistent since this monitoring effort started in 2015. However, some adaptation has been required as the effort progresses. Changes from previous years' protocols are highlighted below. Full methods are described in Appendix C.

- Due to COVID-related restrictions, no data was collected on reef height and reef footprint in fall 2020. Data collection for these metrics will resume in fall 2021, assuming COVID protocols allow.
- Oyster biomass metric: As in past years, oyster biomass per m^2 was calculated from the size (shell height) of individual live oysters within each sample. In 2020, the shell height-to-biomass regression developed by Jordan et al.[10] was used for these calculations (see Appendix C for formula and full description). This is a change from past years, where the regression developed by Mann and Evans[11] was used to calculate biomass. The Workgroup determined that the Jordan et al. regression was more appropriate because it was developed using only Maryland oysters. The Mann and Evans regression, by contrast, was developed using oysters on the James River in Virginia, which may grow differently due to different ambient conditions. DNR uses the Jordan et al. regression in its biomass calculations for the annual oyster Fall Oyster Survey, so switching to the Jordan et al. regression brings the biomass calculation methodologies in this report in line with the DNR standard.
- Shell budget metric: In typical years, shell budget is assessed by comparing the current year shell volume with shell volume from three years prior. Sites that do not have significant differences between those

measurements are deemed to have a stable shell budget. Upon examining the data set from three years ago (2017), the Workgroup realized that, on the stone reefs that year, divers had not excavated the entire dive quadrat when collecting this data. This resulted in likely errors in the 2017 shell volume data set. Therefore, instead of comparing *shell volume* between 2017 and 2020, *oyster volume* (clumps and individual oysters) was compared between 2017 and 2020, as it was likely a truer representation of shell budget. Analysis of variance followed by Tukey's HSD was used to determine if changes between years were significant. Sites that did not have significant decreases between oyster volume measurements in 2017 and in 2020 were deemed to have a stable shell budget. This was done only for diver-surveyed reefs (those constructed from stone or fossil shell), as the patent tong reefs in 2017 did not experience this data issue. See Appendix A to see which reef-base material, and which monitoring gear, was used for each reef.

Section 3: Results Summary

Section 3.1: Summary of Fall 2020 Monitoring Results

On reefs monitored in fall 2020 (Table 3):

- For three-year-old reefs (Little Choptank River and Tred Avon River reefs combined; all Harris Creek reefs are older than three years):
  - 98% of restored reefs met the minimum threshold oyster density success criterion, and 50% met the higher, target density.
  - Oyster biomass tracked closely with oyster density (Figure 5).
  - 100% of restored reefs met the multiple year class criterion.
- For six-year-old reefs (Harris Creek and Little Choptank River reefs combined; no Tred Avon River reefs have matured to six years):
  - 100% of restored reefs met the minimum oyster density success criterion and 93% met the higher target density.
  - Oyster biomass tracked closely with oyster density (Figure 5).
  - 100% of restored reefs monitored met the multiple year class and shell budget criteria.

Reef Type	Tributary	# of reefs monitored in fall 2020	Oyster Density		Oyster Biomass		Multiple Year Classes	Shell budget
			% meeting minimum threshold	% meeting target	% meeting minimum threshold	% meeting target	% with multiple year classes present	% with stable/ increasing
3-year-old	**All tribs combined**	**40**	**98%**	**50%**	**100%**	**43%**	**100%**	**TBD @ 6 years***
	Little Choptank	21	100%	95%	100%	76%	100%	TBD @ 6 years*
	Tred Avon	19	95%	0%	100%	5%	100%	TBD @ 6 years*
6-year-old	**All tribs combined**	**27**	**100%**	**93%**	**100%**	**81%**	**100%**	**100%**
	Harris Creek	14	100%	93%	100%	86%	100%	100%
	Little Choptank	13	100%	92%	100%	77%	100%	100%
Reference Reefs	Harris Creek	4	75%	25%	75%	25%	100%	NMA**
	Little Choptank	3	100%	100%	100%	100%	100%	NMA**
	Tred Avon	3	67%	0%	67%	0%	100%	NMA**

**Reef shell volume at three years will be compared to that at six years to determine success relative to the shell budget metric.*
***Not measured annually on reference reefs.*

Table 3: *Percent of three-year-old, six-year-old, and reference reefs monitored in fall 2020 that met each Oyster Metrics success criteria. In 2020, only Little Choptank River and Tred Avon River had three-year-old reefs, and only Harris Creek and Little Choptank River had six-year-old reefs.*

Section 3.2: Summary of Cumulative Results, 2015-2020

Looking at all restored reefs monitored from 2015-2020 combined (Table 4):

- For three-year-old reefs, across all tributaries:
  - 96% of restored reefs met the minimum oyster density success criterion and 74% met the higher target oyster density.
  - Oyster biomass tracked closely with oyster density (Figure 5).
  - 100% of restored reefs met the multiple year class success criterion.
- For six-year-old reefs (Harris Creek and Little Choptank River reefs combined; no Tred Avon River reefs have matured to six years):
  - 99% of restored reefs met the minimum oyster density success criterion and 77% met the higher target density.
  - Oyster biomass tracked closely with oyster density (Figure 5).
  - 100% of restored reefs met the multiple year class and shell budget success criteria.

Reef Type	Tributary	# of reefs moitored 2015-2020	Oyster Density		Oyster Biomass		Multiple year classes	Shell budget
			% meeting minimum threshold	% meeting target	% meeting minimum threshold	% meeting target	% with multiple year classes present	% with stable/ increasing
3-year-old	**All tribs combined**	**203 (711)**	**96%**	**74%**	**97%**	**69%**	**100%**	**TBD @ 6 years***
	Harris Creek	90 (348 acres)	98%	80%	98%	81%	**100%**	TBD @ 6 years*
	Little Choptank	84 (282 acres)	98%	89%	98%	76%	100%	TBD @ 6 years*
	Tred Avon	29 (81 acres)	86%	10%	90%	10%	100%	TBD @ 6 years*
6-year-old	**All tribs combined**	**70 (310 acres)**	**99%**	**77%**	**99%**	**69%**	**100%**	**100%**
	Harris Creek	57 (257 acres)	98%	74%	98%	67%	100%	100%
	Little Choptank	13 (53 acres)	100%	92%	100%	77%	100%	100%

**Reef shell volume at three years will be compared to that at six years to determine success relative to the shell budget metric.*

Table 4: *Percent of three-year-old and six-year-old reefs monitored from 2015-2020 that met each Oyster Metrics success criteria. Only Harris Creek and Little Choptank River have reefs that have matured to six years. See Section 5 for discussion of results.*

Section 3.3: Density-to-biomass fit plot

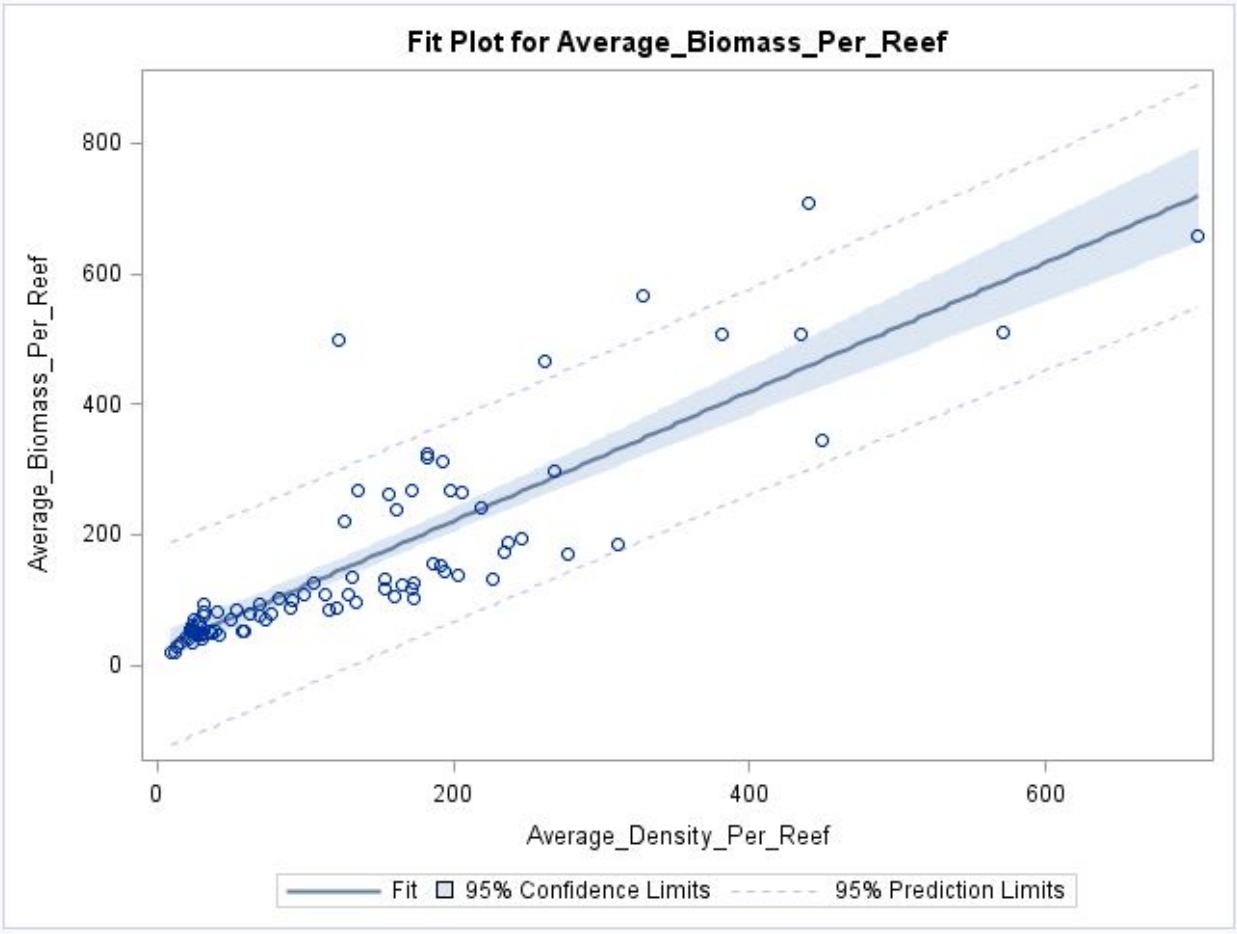

Figure 5: *Fit plot describing the relationship between oyster density and oyster biomass on all reefs monitored in fall 2020.* $R^2 = 0.74$, $p < 0.0001$, *slope= 0.99.*

Section 4: Discussion

- Trends observed in previous monitoring years generally continued in 2020, with a large majority of restored reefs meeting the Oyster Metrics success criteria.
- Per Oyster Metrics, a reef is considered successfully restored if, at six years post restoration, it meets the minimum threshold oyster density, biomass, and the other success criteria.
- Data and analysis in this report can be used by restoration partners to understand the success or failure of reefs relative to the six Oyster Metrics criteria, and to inform future restoration and adaptive management. The monitoring undertaken three years post restoration is considered an adaptive management checkpoint. Information from this interval is used by restoration partners to determine whether a reef requires the second-year-class seeding called for in each river's tributary plan, and if unsuccessful reefs should receive other management actions.
- Harris Creek was the first of the planned 10 tributaries to have its oyster restoration work completed. As of fall 2020, 57 of its 90 reefs have matured to six years—the point where, per Oyster Metrics, a reef can be considered truly 'restored' if it meets all of the Oyster Metrics success criteria. Of these 57 reefs, 56 meet the biological Oyster Metrics minimum success criteria (oyster density, oyster biomass, multiple year classes, and shell budget). Forty-two of the 57 reefs meet the higher, target oyster density and biomass success criteria. (See Table 4). Due to COVID-related restrictions, the 14 reefs in the fall 2020 six-year-old reef class were not monitored for the structural metrics (reef height and reef footprint). However, 100% of the six-year-old reefs that have been monitored as of fall 2019 for these metrics were successful[12]. This bodes well for the overall restoration success of Harris Creek. The final 33 Harris Creek reefs will turn six years old in fall 2021, and will be monitored for all Oyster Metrics success criteria.
- The percent of three-year-old reefs meeting the target oyster density is down from 85% in fall 2019 to 50% in fall 2020. This decrease is likely attributable to the number and type of reefs that were monitored in fall 2020 in the Tred Avon River. The earliest reefs built in this river were seed-only or shell-base reefs, which, per the monitoring methods used in this effort (see Appendix C), typically show lower oyster densities across all tributaries than their stone or fossil shell counterparts. These lower-density reefs reduce the cumulative percentage of reefs meeting the target density metric. Additionally, Tred Avon has historically shown lower spat sets than Harris Creek and Little Choptank River, so reefs here may not benefit from robust natural recruitment. This could also affect the ability of the Tred Avon River seed-only and shell reefs to meet the higher, target oyster density.
- 2020 was the first year that restored reefs in the Little Choptank River had matured to six years. It is encouraging to see that 100% of the reefs met the minimum Oyster Metrics density success criterion and 92% met the higher, target criterion. Initial restoration work in this tributary started in 2014 and was completed in 2020.
- In the Tred Avon River, one three-year-old reef (reef T13; 1.95 acres) did not meet the minimum Oyster Metrics density success criterion. The density on this reef in fall 2020 fell just shy of the minimum, at an average density of 13.3 oysters per m^2. The reef did, however, just meet the minimum threshold for oyster biomass, with an average biomass across the reef of 15.3 grams dry tissue weight per m^2. The restoration treatment used on this reef was seed only (see Table 2 for description). This reef will receive a second-year-class seeding in 2021 to help ensure it meets the oyster density success criterion at year six.

- Although the information in this report looks promising for success in Harris Creek, Little Choptank River, and Tred Avon River, several factors could affect continued success. These include future water-quality issues (e.g., low salinity, low river bottom dissolved oxygen levels), oyster disease, funding, and poaching (illegal oyster harvesting).

Section 5: Definitions

Fall 2020 monitoring: Monitoring undertaken on restored reefs that turned three or six years old in fall 2020. Monitoring was also done on reference reefs and sentinel reefs. Actual data collection extended from October 2020 through January 2021.

Fossil shell: Consolidated fossil oyster shell material from Florida used as a base to construct reefs. This is oyster shell cemented into a fossilized limestone, and is a true fossil, mined from 30 to 40 feet under dry land, as opposed to the Chesapeake Bay dredged shell.

Mixed shell: A mixture of scallop, conch, and clam shell from seafood processing plants.

Oyster gardening reef: A reef planted with oysters from various community-based oyster gardening programs, where volunteers grow oysters in cages hanging from docks.

Oyster Metrics: Success criteria for restored oyster reefs targeted for restoration under the 2014 Chesapeake Bay Watershed Agreement. These are defined in the report "Restoration Goals, Quantitative Metrics and Assessment Protocols for Evaluating Success on Restored Oyster Reef Sanctuaries."[2] See Table 1 for description of the six reef-level criteria.

Premet reefs: Reefs that were assumed to have met the Oyster Metrics density target criteria (50+ oysters per m^2) when surveyed prior to commencement of large-scale restoration efforts, and therefore did not initially receive further restoration treatment. However, the prerestoration data on some reefs was at an insufficient resolution to determine definitively whether or not the reefs met the density target. Thus, it is an assumption that the reefs in fact met the density success metric at that time, but it is not certain. These reefs are monitored every three years, as are other reefs, to determine appropriate adaptive management needs.

Reef restoration treatment: The particular method used to restore a reef. See Table 2 for description of reef treatment types.

Reference reefs: Reefs left unrestored (untreated) to serve as comparisons to restored (treated) reefs. Typically, these would be called 'control' reefs, but they are not true controls, as it is not possible to ensure that restoring nearby reefs would not influence these reference reefs. That is, these reefs might receive larvae from nearby restored reefs, so the term 'reference reefs' is used. Per oyster population data collected prior to commencing large-scale restoration work in Harris Creek, the reference reefs did not meet the 50 oysters per m^2 Oyster Metrics target success criterion. See Table 2 for reef treatment type relative to other treatment types.

Second-year-class seeding: A second planting of spat-on-shell some reefs receive approximately four years after initial restoration. This is intended to ensure that each reef has at least two year classes, which is an Oyster Metrics criteria. It can also help ensure that reefs meet the oyster density and biomass criteria. Second-year-class seedings are called for in each river's oyster restoration tributary plan. If a reef shows higher-than-expected oyster density when monitored three years post restoration, and a second year class is present, a second-year-class seeding may not be required.

Seed-only reefs: Reefs treated only with hatchery-produced oyster seed (spat-on-shell). No base reef-building substrate was added prior to seeding. This treatment was generally used on reefs where the prerestoration population was five oysters per m^2 or greater, but fewer than 50 oysters per m^2 (see Harris Creek Tributary Plan[2], Little Choptank Tributary Plan[3], and Tred Avon Tributary Plan[4] for detailed description of how the

Workgroup determined treatment type for each reef). See Table 2 for reef treatment type relative to other treatment types.

Sentinel reefs: A subset of the restored reefs that are monitored annually (rather than only three years and six years after restoration, which is the standard for other restored reefs). See Table 4 for reef treatment type relative to other treatment types.

Six-year-old reef: Reef that received restoration treatment in 2014, and—per Oyster Metrics and tributary plans— was monitored in 2017 (three years post restoration) and again in 2020 (six years post restoration).

Spat-on-shell: Hatchery-produced juvenile oysters attached to the shells of dead oysters. Shell typically comes from shucking houses.

Stone substrate reefs: Reefs constructed using a type of stone that is geologically classified as amphibolite. The stone was graded to fit through a six-inch mesh screen. These reefs were then seeded with spat-on-shell. See Table 2 for reef treatment type relative to other treatment types.

Stone reefs topped with mixed shell: Reefs constructed from a stone base, then capped with mixed shell and seeded with spat-on-shell. See Table 2 for reef treatment type relative to other treatment types.

Stone reefs topped with fossil shell: Reefs constructed from a stone base, then capped with fossil shell and seeded with spat-on-shell. See Table 2 for reef treatment type relative to other treatment types.

Substrate + seed reefs: Reefs treated with reef-building substrate, generally to a height of six inches to one foot above the surrounding soft bottom. Substrate was either mixed shell, fossil shell, stone, or a combination. Substrate placement was followed by planting with hatchery-produced spat-on-shell. Substrate + seed treatment type was typically used where prerestoration oyster populations were below five oysters per m^2, or where sonar surveys found no evidence of shell. See Table 2 for reef treatment type relative to other treatment types.

Three-year-old reef: Reef that received restoration treatment in 2017, and—per Oyster Metrics and tributary plans—was monitored in 2020 (three years post restoration).

References

1. Chesapeake Executive Council, 2014. Chesapeake Bay Watershed Agreement. https://www.chesapeakebay.net/documents/FINAL_Ches_Bay_Watershed_Agreement.withsignatures-HIres.pdf
2. Restoration Goals, Quantitative Metrics and Assessment Protocols for Evaluating Success on Restored Oyster Reef Sanctuaries. Report to the Sustainable Fisheries Goal Implementation Team of the Chesapeake Bay Program. Oyster Metrics Workgroup. 2011. https://www.chesapeakebay.net/who/publications-archive/maryland_and_virginia_oyster_restoration_interagency_teams
3. Harris Creek Oyster Restoration Tributary Plan: A blueprint to restore the oyster population in Harris Creek, a tributary of the Choptank River on Maryland's Eastern Shore. Maryland Interagency Oyster Restoration Workgroup of the Sustainable Fisheries Goal Implementation Team. 2013. https://www.chesapeakebay.net/who/publications-archive/maryland_and_virginia_oyster_restoration_interagency_teams
4. Little Choptank River Oyster Restoration Tributary Plan: A blueprint for sanctuary restoration. Maryland Interagency Oyster Restoration Workgroup of the Sustainable Fisheries Goal Implementation Team. 2015. https://www.chesapeakebay.net/who/publications-archive/maryland_and_virginia_oyster_restoration_interagency_teams
5. Tred Avon River Oyster Restoration Tributary Plan: A blueprint for sanctuary restoration. Maryland Interagency Oyster Restoration Workgroup of the Sustainable Fisheries Goal Implementation Team. 2015. https://www.chesapeakebay.net/who/publications-archive/maryland_and_virginia_oyster_restoration_interagency_teams
6. St Marys River Oyster Restoration Tributary Plan: A blueprint for sanctuary restoration. Maryland Interagency Oyster Restoration Workgroup of the Sustainable Fisheries Goal Implementation Team. 2020. https://www.chesapeakebay.net/who/publications-archive/maryland_and_virginia_oyster_restoration_interagency_teams
7. Manokin River Oyster Restoration Tributary Plan: A blueprint for sanctuary restoration. Maryland Interagency Oyster Restoration Workgroup of the Sustainable Fisheries Goal Implementation Team. 2020. https://www.chesapeakebay.net/who/publications-archive/maryland_and_virginia_oyster_restoration_interagency_teams
8. Chai A, Homer M., Tsai C., Goulletquer P. (1992). Evaluation of oyster sampling efficiency of patent tongs and an oyster dredge. North American Journal of Fisheries Management, 12, 825-832.
9. Oyster Recovery Partnership. 2020. Evaluating Hydraulic Patent Tong Efficiency to Estimate Oyster Density on Restored Oyster Reefs. https://www.chesapeakebay.net/documents/ORP_CBL_Project_Award_15794_Final_Report_with_SFGIT_context_statement.pdf
10. Jordan, S. J., Greenhawk, K. N., McCollough, C. B., Vanisko, J., & Homer, M. L. (2002). Oyster biomass, abundance, and harvest in northern Chesapeake Bay: trends and forecasts. Journal of Shellfish Research, 21(2), 733-742.
11. Mann, R. L., & Evans, D. A. (1998). Estimation of oyster, Crassostrea virginica, standing stock, larval production and advective loss in relation to observed recruitment in the James River, Virginia. Journal of Shellfish Research, 17(1), 239.

12. Maryland Oyster Restoration Interagency Workgroup under the Chesapeake Bay Program's Sustainable Fisheries Goal Implementation Team. 2019 Oyster Reef Monitoring Report: Analysis of Data from Large-Scale Sanctuary Oyster Restoration Projects in Maryland Collected from Fall 2019 through Summer 2020. 2020. https://www.chesapeakebay.net/who/publications-archive/maryland_and_virginia_oyster_restoration_interagency_teams

Appendix A: Table of Summary Data by Reef

To access Appendix A, please click on this link to download an Excel file.

Appendix B: Length-Frequency Histogram for Each Reef

Appendix B is broken into two tables:

- B1: Length-frequency histograms for reefs monitored using divers.
- B2: Length-frequency histograms for reefs monitored using patent tongs.

To access Appendix B, please click on this link to download an Excel file.

Appendix C: Methods for Data Collection and Analysis

This section describes methods for determining success relative to biological Oyster Metrics criteria (oyster density, oyster biomass, multiple year classes, shell budget). No data was collected in 2020 for the remaining two Oyster Metrics success criteria (reef height and reef footprint), due to COVID-related constraints.

Survey Design

A stratified random survey is used to collect biological data on restored reefs. Each reef is its own stratum, and a random number of sample points are assigned based on reef size, reducing relative error among samples. The number of samples collected at each reef is optimized for data precision and accuracy for each gear type used (Slacum et al. 2018).

- For reefs sampled using patent tongs: the number of samples increased with reef size, and averaged 6.1 samples per acre.
- For reefs sampled using divers: five samples were collected per reef, averaging 4.8 samples per acre.

ArcGIS is used to generate sampling points for each reef. All reefs that are due for monitoring are compiled into a shapefile, and samples are generated within the area of the reef that was planted with spat on shell. This ensures that sample points are created within the area that received oysters.

Field Component

Data are typically collected in the fall. The gear used depends on the reef material. Hydraulic patent tongs are used to sample on seed-only reefs, mixed-shell-base reefs, reference reefs, and premet reefs. Divers are used to sample on fossil-shell-base reefs, stone-base reefs topped with mixed shell, and stone-based reefs topped with fossil shell. Because two different gear types are employed, it is not appropriate to directly compare oyster density and biomass on reefs sampled with patent tongs versus divers (see Section 2.2: Methods summary). For both diver and patent tongs data, oyster density and oyster biomass information are standardized based on area sampled.

Sampling is conducted during daylight hours. Navigation to sampling locations and sample coordinate documentation is done using a differential global positioning system (DGPS) attached to a laptop with ArcView 10.2 used as the navigational program. The vessel navigates as closely as possible to the designated random points, and a waypoint (virtual GPS marker) is created at the location of each sample.

Patent Tongs

Hydraulic patent tongs are a specialized commercial fishing gear used to harvest oysters in the Chesapeake Bay. The patent tong design functions much like a benthic grab, collecting oysters and underlying substrate from a known fixed area of the bottom. The tongs used in 2020 sampled an area equal to 1.928 m^2 of the seafloor. The patent tongs are suspended from a boom over one side of the vessel and deployed to the bottom at each sampling location. A DGPS antenna is positioned adjacent to the location where the patent tongs are deployed, and a waypoint with the geographic coordinates of each sample location is documented.

Diver Surveys

Diver surveys are used to collect samples on reefs constructed with either a stone or fossil shell base, and are conducted by navigating the vessel to each sampling location and deploying buoys with anchors to mark each sample location. Divers descend to the bottom at each buoy with a 0.71 m x 0.71 m (0.5041 m^2) quadrat and sample collection crates. The quadrat is placed up current of the buoy anchor.

Before disturbing the reef surface, the diver makes observations on the number of oysters visible and the percent of reef substrate within the quadrat. Any material contained within the quadrat, including loose oysters, loose shell, and any reef substrate, are removed and transported to the vessel for processing.

Sample Processing

In each sample, all oysters are counted and identified as live or dead, and a minimum of 30 live oysters are measured for each sample. Oyster clumps, the number of oysters associated with a clump, and the substrate type that oysters are attached to are documented. The shell height and total count of dead (old box) and recently dead (gapers) oysters are documented from each sample. The percent of the sample covered by tunicates or mussels is documented for each sample. Additionally, field crews record the volume of each sample that is black (anoxic, shell) and measure oyster and shell volume to the nearest half liter using graduated buckets. Surface and bottom water temperature, dissolved oxygen, pH, and salinity are collected during each sampling event using a YSI Pro-Plus water quality sonde (YSI Corporation, Yellow Springs, Ohio). Other environmental and station specific variables collected at each site include sample number, date and time, weather information, depth of water, Yates Bar name, vessel name, and staff conducting the monitoring.

Data Entry and Analysis

All data are entered into a Microsoft Access database. QA/QC protocols are used to review data for nonsensical values and typos. Oyster lengths and counts are used to derive density estimates for each reef. Graphs are made to visually display size class information and proportion of live to dead oysters at the reef level. Additionally, all sample locations are plotted in ArcGIS to ensure that samples are collected on the reef footprint. Methods for analyzing data per each Oyster Metrics success criterion follow.

Oyster Density

- Oyster Metrics success criteria: Minimum threshold = 15 oysters per m^2 over 30% of the reef area; Target = 50 oysters per m^2 over 30% of the reef area.
- Method: Oyster density was calculated as the number of individual live oysters collected in the area of a patent-tong grab or diver quadrat standardized to a square meter. Total counts of live oysters or other variables (e.g., oyster size class, shell volume) were averaged over all samples collected at the individual reef. To meet the Oyster Metrics threshold or target, at least 30% of the samples collected must meet the specified densities. This represents a change from the previous survey design, in which the area of the sampled grid cells meeting the target or threshold must have been equal to or greater than 30% of the reef area. Past years of monitoring data were analyzed using this method to ensure that the methods are comparable.

Oyster Biomass

- Oyster Metrics success criteria: Minimum threshold = 15 grams dry weight per m^2 over 30% of the reef area; Target = 50 grams dry weight per m^2 over 30% of the reef area.
- Method: Oyster biomass per m^2 was calculated from the size of individual live oysters within each sample, using the regression developed by Jordan et al. (2002):

  W =((10^((log10(L)*2.06)-3.76))), where W = dry tissue weight in g and L = shell height in mm

This formula represents a change from previous years of monitoring, which used the regression developed by Mann and Evans. After some discussion, the Workgroup determined that the Jordan et al. regression was more appropriate since it was developed using only Maryland oysters. Biomass was then summed for the entire sample and standardized to a square meter. The biomass value is scaled based on oysters measured out of total oysters counted. The same approach as oyster density (above) was employed, in which at least 30% of samples collected had to meet the threshold or target to demonstrate restoration success.

Multiple Year Classes

- Oyster Metrics success criterion: Presence of two or more year classes of live oysters.
- Method: Year-class presence was approximated by examining length frequency data of all oyster heights measured at each reef. Sampling teams are trained to measure and record all oysters, regardless of size. For simplicity, a reef was determined to have multiple year classes when oysters from at least two standard size class categories (market: >76 mm; small: 40–75 mm; spat: <40mm) were present.
- There is no differentiation between hatchery-produced oysters and natural oysters.

Shell Budget

- Oyster Metrics success criterion: Neutral or positive shell budget on the reef.
- Method: The volume of sampled shell is measured with graduated buckets and standardized to square meter based on the area sampled by patent tong. Field measurements of shell resources included total shell volume and the percent of black (buried) shell estimated in a sample. Surface shell estimates were calculated as the percent of the total sampled shell volume that was not considered black shell, as shown below:

  Surface shell volume=Total shell volume-(Total shell volume*Percent Black Shell)

Calculating shell volume is conducted similarly for diver sampling. The volume of sampled shell is measured in graduated buckets and standardized to square meter based on the size of the diver quadrat for each sample. Alternative substrates (fossil shell, granite) are not included in this volume measurement. Again, the percent of black (buried) shell is visually estimated. Changes to the shell budget at individual reefs were analyzed by comparing shell volume data from 2017 (baseline data, when reefs were three years old) with shell volume data from 2020 (when reefs were six years old). For the 2020 data, the Workgroup reviewed 2017 shell volume data to determine if the budget was increasing or stable. It was found that 2017 volume estimates for granite sites did not involve excavating the entire dive quadrat. Therefore, members of the Workgroup concluded that oyster volume (which was assessed using the counted clumps and individuals) would be a truer representation of volume. Analysis of variance was used, followed by Tukey HSD post-hoc, to determine significant differences between years. Sites that did not have significant differences between measurements in 2017 and

measurements in 2020 were concluded to have a stable shell budget. Sites with significant increases in shell budget were also concluded to have met the metric.

Appendix C References

1. Slacum H. W., Liang D., Wilberg M., Paynter K., and Zaveta D. “Implementing Oyster Restoration Monitoring Recommendations”. Sustainable Fisheries Goal Implementation Team Biannual Meeting, 17 December 2018, The Mariner’s Museum, Newport News, VA.
2. Jordan, S. J., Greenhawk, K. N., McCollough, C. B., Vanisko, J., & Homer, M. L. (2002). Oyster biomass, abundance, and harvest in northern Chesapeake Bay: trends and forecasts. Journal of Shellfish Research, 21(2), 733-742.

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Note: See pages 5-6. Donald Merritt (UMCES HPL) was in favor of dredging Man O War Shoals, noting "the General Assembly directed DNR to apply for a permit to retrieve shells from Man O War several years ago".

Meeting Summary
Oyster Advisory Commission
Wye Education and Research Center
Queenstown, MD
4:00 PM – 7:00 PM
13 February 2013

LIST OF ATTENDEES

Commissioners Present:

Anthony Chatwin (Chair)	National Fish and Wildlife Foundation (NFWF)
Kelley Cox	Phillips Wharf Environmental Center
Douglas Lipton	University of Maryland
Donald Meritt	University of Maryland Center for Environmental Science, Horn Point Lab (UMCES HPL)
Anthony O'Donnell	Maryland Delegate, House Minority Leader, Environmental Matters Committee
Claire O'Neill	U.S. Army Corps of Engineers – Baltimore District
Ben Parks	Maryland Watermen's Association, Dorchester County
Peyton Robertson	NOAA Chesapeake Bay Office
Eric Schott	University of Maryland Center for Environmental Science
Evan Thalenberg (by phone)	Chesapeake Bay Savers
Donald Webster	University of Maryland Extension
Robert Witt	Commercial Waterman
Leonard Zuza	Southern Maryland Oyster Cultivation Society

Commissioners Unable to Attend:

Donald Boesch	University of Maryland Center for Environmental Science
Mark Bryer	The Nature Conservancy
Kelton Clark	Morgan State University
Richard Colburn	Maryland Senator, Dorchester County
William Goldsborough	Chesapeake Bay Foundation
Douglas Legum	General Partner, Real Estate Development
Kenneth Lewis	Coastal Conservation Association
William Richkus	Versar, Inc.
Shane Robinson	Maryland Delegate, Environmental Matters Committee
William Windley	Maryland Saltwater Sportfishermen's Association

Other Meeting Attendees:

Maryland Department of Natural Resources: Lynn Fegley, Frank Marenghi, Michael Naylor, Steven Schneider, Eric Weissberger
Oyster Recovery Partnership: Stephan Abel
Mason Springs Conservancy: Ken Hastings
Philips Wharf Environmental Center: Carol McCollough
Calvert County Watermen's Association: Rachel Dean
National Oceanic and Atmospheric Administration: Peter Bergstrom, Bruce Vogt
Chesapeake Bay Commercial Fishermen's Association: Gibby Dean
Chesapeake Bay Seafood Industry Association: Bill Seiling
Public: Terry Witt

MEETING SUMMARY:

Opening Remarks/Review Objectives/Approve October 17, 2012 Meeting Summary (Anthony Chatwin, Oyster Advisory Committee Chairman)

Dr. Chatwin opened the meeting at 4:15. A motion was made to approve the minutes of the October 17, 2012 meeting. The minutes were approved.

Public Comment
Dr. Chatwin opened the floor for public. Ms. Rachel Dean of the Calvert County Watermen's Association read a prepared statement. Ms. Dean requested information on how the charter was developed, and would like the industry to be involved in any discussion of restructuring of the oyster fishery. Ms. Lynn Fegley of the Department of Natural Resources (DNR) replied that it is the commission's charge to review and comment on any biological reference points, and that input from the industry will be considered. Ms. Dean expressed concern that by the time any document went to public comment that it would be too late for meaningful input.

Land Use Effects on Fisheries (Margaret McGinty, DNR)
Land use is one of the issues addressed in the new charter, and several commissioners had questions about the relationship between land use and oysters. Dr. Chatwin introduced Ms. McGinty to discuss the work she has been doing examining the relationship between land use and finfish biology. Michael Naylor of DNR commented that he has been working with Ms. McGinty for 17 years, identifying linkages between land use and water quality.

Ms. McGinty presented her research on the effects of urbanization on fish, using impervious surface as an indication of development. Although her presentation focused on tidal fish, Ms. McGinty made it clear that what happens in non-tidal areas affects the organisms and habitats downstream. Increased development was associated with decreased dissolved oxygen, increases in PCBs, decreased fish abundance, decreased fish spawning, decrease in fish egg viability, impaired fish development, and decreased fish feeding. Ms. McGinty suggested that these changes indicated an ecological regime shift in developed areas. She recommended fisheries management based on the amount of impervious surface in a watershed, with harvest restrictions,

stocking, watershed conservation and restoration in watersheds with < 5% impervious surface, conservation and watershed rehabilitation with the option to stock and decrease harvest in watersheds with 5-10% impervious surface, and conservation and re-engineering of the watershed in areas with >10% impervious surface. Ms. McGinty concluded by stating that land use planning can protect aquatic habitat by limiting impervious surfaces and conserving rural land. She also stressed the need to understand the limitations of storm water best management practices.

Dr. Eric Schott questioned the use of impervious surface as a proxy for development, suggesting that eutrophication is the real issue that needs to be addressed. He indicated that urban areas are mandated to reduce nutrient input to waterways, and wondered if this would be effective at improving water quality. Dr. Schott also inquired if flashy streams still occurred. Ms. McGinty responded that the science was still out whether the reduction of nutrient impacts had measurable effects on fish and their habitat, and that flashy streams indeed occur. It is likely that the effects of flashy streams and nutrients are cumulative, but it is difficult to separate the effects of each.

Delegate O'Donnell asked if Ms. McGinty had considered the historical and sociological aspects of her analyses. Ms. McGinty said that DNR understands the needs of counties. She said that development does not need to be stopped, but that people should be aware of the consequences of development, and that there are ways to minimize impact through ecosystem based management.

Dr. Douglas Lipton suggested that the use of impervious surface as a proxy for development was an over-simplification of development and that the real problem is much more complicated. Ms. McGinty responded that imperviousness is used because it can be measured, and that other indicators of development, such as housing density, may be used. Dr. Lipton mentioned that the way development occurs now differs from the way it occurred in the past, and that reduction of impervious surfaces doesn't ameliorate all of the effects of development on aquatic habitats.

Mr. Leonard Zuza asked if there were any specific rehabilitative steps shown to be effective. Ms. McGinty responded that the conservation of rural landscapes is the most effective approach. However, there is little monitoring to gauge the effectiveness of restoration projects. Preliminary results from a study in Montgomery County indicate that best management practices are performing well; in some cases they are performing better than expected. However, results from biological monitoring indicate varying degrees of degradation in the streams. Performance of the BMPs does not directly reflect the health of the organisms living in the receiving streams. It may not be possible to reverse the regime shift.

Mr. Peyton Robertson stated that different systems respond in different ways. Pervious surfaces may influence sediment and nutrients, but not necessarily toxic substances. Local planners must weigh the ecological and economic implications of their land use decisions, and make people aware of the trade-offs. For example, oysters filter the water, but they can also be harmed by land use decisions. We need to be smart about the placement of oyster restoration projects, and place them in areas where they won't be covered by sediment.

Dr. Schott advised that we have to manage expectations that oysters are the solution to what's happening upstream. Ms. McGinty responded that there is not much in the literature on the relationship between oysters and land use.

Dr. Chatwin said that we need to better understand the impacts of land use on oysters, and asked what opportunities DNR has to advise on land use. Ms. McGinty replied that DNR and other state departments are developing tools for land use decision making. DNR has met with county planners to demonstrate the tools. DNR is also working with the Sustainable Fisheries Goal Implementation Team to address land use issues.

Mr. Bruce Vogt commented that NOAA has not yet analyzed the ecological effects of land use decision making. He suggested putting together a STAC proposal to bring together people who have developed decision-making tools to create one resource package. Mr. Vogt also suggested engaging citizens, including representatives from the commercial and recreational fishing industry, in land use planning efforts.

Mr. Donald Webster recalled an anecdote about someone who asked what it would take to restore Chesapeake Bay to the way it was in John Smith's time. The answer was to move everyone out of the watershed and wait 100 years. Mr. Webster also said that from the data presented, it seemed not to be cost-effective to continue to place oysters in the Severn River. Ms. McGinty responded that the Severn experiences hypoxia and has high concentrations of metals and endocrine disruptors. She inquired as to the goal of putting oysters in the Severn River, such as increasing dissolved oxygen concentration. Mr. Webster inquired if hypoxic water was flowing from rivers into the bay which might affect adjacent oyster grounds. Ms. McGinty replied that the opposite was true, with normoxic water flowing from the bay into the rivers.

Delegate O'Donnell mentioned that there were two schools of thought on oyster fisheries either remove fishing pressure or work oysters to keep them healthy. He inquired if Ms. McGinty had examined the differences between oysters and finfish, as oysters are sedentary and finfish are mobile. Ms. McGinty replied that her group had not yet done any oyster work.

Harris Creek Permit Update

Mr. Naylor updated the Commission on the status of the Army Corps-Maryland Department of the Environment permit application to restore oyster reefs in shallow water in Harris Creek. DNR applied for the permit because there was insufficient area in deep water to reach restoration goals. A public hearing was held on February 12, 2013 at Easton High School to obtain comments on the project. Crabbers are concerned that the project will negatively impact their crabbing, with trot lines getting caught in the stone planned for restoration. The crabbers are also concerned that the timing of reef construction may also negatively affect crabbing. The week before the public hearing Mr. Naylor and Ms. Fegley met with crabbers on Tilghman Island to explain the project and address their concerns. At the hearing, several watermen explained their concern to the regulators, and representatives from NOAA and the Chesapeake Bay Foundations spoke in favor of the project.

Mr. Zuza expressed his hopes for the permit's approval, and that it would set a precedent for restoration in shallower waters. He cited Dr. Denise Breitburg's findings that oxygen conditions and food supply are better in shallower water.

Mr. Parks reiterated the watermen's concern over the use of stone in the project, saying that you can't crab on stone.

Delegate O'Donnell was concerned about the use of concrete and rubble in Harris Creek. Mr. Naylor explained that even though those materials were mentioned in the permit, DNR plans to use only stone and shell in Harris Creek. The stone will be 6-7 inches in size, comparable to the size of a large oyster.

Ms. Cox informed the Commission of a talk on the Harris Creek restoration project given at the Phillips Wharf Environmental Center, where crabbers expressed concern over trot lines snagging on rocks. Ms. O'Neill said that the Army Corps was using granite 3-6 inches in size.

Dr. Meritt wondered why alternate materials were being used for reef construction when large amounts of buried shell could be used. Dr. Meritt said we need to look at different methods for recovering buried shell, and not to restrict ourselves to the use of previously-planted shell.

Mr. Webster noted that the General Assembly had directed DNR to apply for a permit to retrieve shells from Man o' War shoals several years ago, and requested the status of the permit. Mr. Naylor replied that DNR had submitted a permit application, and was in the process of responding to the Army Corps' request for additional information.

Ms. O'Neill inquired about the timeline for the Harris Creek permit. Mr. Naylor replied that there were no guidelines on the time to process the permit application.

Mr. Parks noted that Langenfelder can move more shell in one day than watermen can in one year. He state that shell does not interfere with crabbing, and that reef life develops on shell very soon after it is placed in the water.

Delegate O'Donnell said that shell availability has been a problem for years, and the issue must be resolved. The General Assembly directed DNR to apply for a permit to retrieve shell from Man o' War shoals, and partners in the conservation community are needed to get the shell.

Mr. Parks commented that nobody had shell, including the public fishery, aquaculturists, or the restoration program. All need to work together to solve the shell problem.

Mr. Zuza noted that there is no mention of shells in the new OAC charter. Dr. Chatwin replied that shells must be part of the discussion. Mr. Zuza asked about the politics of getting shell and making it available. Dr. Chatwin said that a discussion of substrate must include shell as well as alternate substrates.

Delegate O'Donnell said that alternative substrate should not distract us from getting shell.

Mr. Parks asked about the price of shell from Langenfelder. Mr. Naylor replied that it used to be less than a dollar per bushel, but gas prices have risen since that price was quoted.

Dr. Meritt replied that enough shell is available, and that we need to identify the locations of shell deposits and obtain the permits and funding necessary to retrieve these deposits. Delegate O'Donnell echoed Dr. Meritt's sentiments. Furthermore, Delegate O'Donnell insisted that DNR stop saying that there is a shortage of shell. If the State were to decide to make shell available, there would be no need to consider alternate substrate material. The use of shell substrate would reduce both program cost and public opposition to preparing bottoms for spat plantings.

Mr. Robertson noted that the ultimate goal is oyster restoration, and achieving that goal involves a discussion of cost-effectiveness. The goal must be discussed in the context of resources currently legally available. The policy preference for shell or alternative substrate must also be discussed in the context of cost-effectiveness. Mr. Zuza commented that we must examine the price of shell today vs. the cost of obtaining dredged shell. No recommendations can be made on funding until there is more definite information regarding the availability of shell. Given the price disparity between shell and other substrates, it is not possible to identify reliable cost-effective restoration strategies until after the availability and cost of shell is known.

Mr. Naylor noted that contrary to the claims of Dr. Meritt and Delegate O'Donnell, there is no map showing large deposits of readily exploitable shell.

Discussion of OAC Plan and Subcommittees

Dr. Chatwin noted that the OAC charter identifies specific issues and outcomes to be addressed within a 2 year time frame. Given the current OAC meeting schedule of 3 three-hour meetings per year, the commission has 18 hours to achieve the outcomes specified in the charter. The fishery management plan biological reference points are not ready for discussion; therefore Dr. Chatwin recommended postponing them until year 2, and focusing on the remaining four charges from the two other sections of the charter: cost-effective restoration and protection. Dr. Chatwin suggested that subcommittees could help achieve the goals of the charter by meeting in between OAC meetings and bringing back information to discuss with the full commission. He mentioned that there had been both interest and concern about subcommittees, and that the main goal was to be productive. Dr. Chatwin then asked the commission for their recommendations on how to approach the work they are charged with.

Dr. Lipton said he would like to hear the plan to develop biological reference points before they are developed. He also mentioned that the OAC had subcommittees to begin with, and that they were productive. The subcommittees brought work to the whole Commission and a lot of progress was made

Mr. Webster noted that it would be helpful to bring in outside members with the expertise necessary to address the charges.

Dr. Meritt mentioned that the OAC has lacked direction and focus, and that he is happy to see specific objectives and goals. He felt it was important to prioritize the goals and do what it takes to achieve them, and that presentations are not a good use of the Commission's time. Dr. Meritt

noted that the Oyster Roundtable was encouraged to think outside the box, but it seems like the charter is putting too many constraints on the OAC. He recommended letting the OAC make recommendations on issues they feel are important.

Delegate O'Donnell said that he felt the OAC is guided to where DNR would like to go, and it would be better to let the Commission make independent recommendations.

Dr. Chatwin said that the group must focus on a certain number of topics to be effective, and that these issues are identified in the charter. If the Commission feels that they need to think more broadly to achieve these goals, then that is permissible. He asked what presentations would be helpful for making recommendations to the department. Dr. Meritt replied that would be helpful to have more information in advance of discussion at the meetings, and Dr. Chatwin agreed.

Mr. Robertson asked how much time people were willing to commit to achieving the outcomes specified in the charter. He said that briefing packets and identification of alternatives would be helpful, and asked who is available to gather materials for the subcommittees.
Ms. Fegley commented that DNR has limited resources for staffing subcommittees. DNR can provide support for focused tasks, but staff is not available for open-ended use.

Mr. Zuza said that even with the varied backgrounds of the OAC members and guest experts, there is not enough time to achieve the goals of the charter without subcommittees to work on the issues between meetings. The subcommittees can then provide recommendations to the whole commission.

Ms. O'Neill felt that subcommittee comprising 4-6 people with a team leader would be effective. The team leader would reach out to the whole Commission for input.

Mr. Webster mentioned that workgroups were used in the Aquaculture Coordinating Council (ACC). Each workgroup is chaired by an ACC member, but outside expertise can be brought in. All meetings are open to the public, and all issues discussed by the workgroups are brought to the full ACC for review. The ACC chairman and the head of the DNR aquaculture program frame the questions for the workgroups.

Dr. Chatwin stressed that the work of subcommittees must be done between meetings, and recommended that one subcommittee meet between this meeting and next to see how well this will work.

Dr. Meritt said that the assumption was that it would take a lot of support staff to operate with subcommittees. He suggested that subcommittees might not require much support staff, and that subcommittees should be given a chance given how well they worked in the past.

Mr. Webster replied that the OAC's recent Economic Restoration Workgroup functioned well without any staff.

Mr. Zuza said there's no reason why all subcommittees can't start collecting information and lining up relevant speakers.

Delegate O'Donnell asked where the charges in the OAC charter came from. Dr. Chatwin replied that the charter was developed by DNR and discussed by the Commission. Delegate O'Donnell then mentioned that workgroups were used in the legislature and that they worked well.

Delegate O'Donnell commented that the Natural Resources Police patrol charge might be more appropriately addressed by the ACC, an interagency body. He noted the differences between the ACC and the OAC, with the OAC being an advisory body to DNR. Delegate O'Donnell also said that the patrol charge was leading the OAC down a path the DNR would like to go.

Mr. Robertson commented on the charge relating to the effectiveness of enforcement. He recommended collecting data on effectiveness of enforcement and evaluating those data before making recommendations on patrol frequency.

Dr. Lipton said the Commission should not feel confined by the charter, and that is starting point for discussing important issues. Dr. Lipton recommended discussing the shell issue first.

Mr. Parks commented that public oyster bar restoration should be considered under discussions of restoration

Dr. Meritt asked if the charter charges could be modified. Dr. Chatwin replied that the way the OAC interprets the charges is up to the Commission. He said that we can discuss issues different than the ones mentioned in the charter, and that if the Commission feels DNR missed the mark on some charges, then that can be discussed.

Ms. Fegley said that if the OAC has advice on issues other than those specified in the charter, then the OAC is free to advise DNR on those issues.

Dr. Chatwin suggested keeping the three original subcommittees, rather than dividing the subcommittees by charge. According to this scheme, the cost-effective restoration subcommittee would consider both substrate and funding issues. Dr. Meritt felt that substrate and funding require different expertise, and that those issues were best addressed separately, then brought back together.

Based on the subcommittee discussion and the fact that biological reference points are not ready for discussion, four subcommittees were established: Funding, Substrate, Land Use, and Enforcement. Ms. O'Neill volunteered to chair the Substrate Subcommittee, and Mr. Robertson agreed to chair the Land Use Subcommittee.

Dr. Schott suggested that the Land Use Subcommittee could collect information on oysters and Land Use to complement the Ms. McGinty's presentation on finfish and land use.

Dr. Lipton commented that substrate solutions can be implemented relatively quickly, whereas addressing land use issues is a longer-term process.

Dr. Schott commented that the two issues are related, and that we should not be placing substrate in waters where oysters won't grow because of upstream impacts.

Delegate O'Donnell warned not to make decisions on oysters based on Ms. McGinty's finfish presentation.

Dr. Chatwin inquired what will happen between now and the next meeting. Delegate O'Neill said to let each subcommittee decide how it will proceed from here. Dr. Meritt suggested that the subcommittees make reports available before the next meeting so that the full OAC has time to read the reports. He also offered meeting space for the subcommittees at Horn Point Laboratory. Dr. Chatwin advised each subcommittee to develop a work plan, decide if outside input is necessary, and suggest presenters who may provide information that would help the OAC address its charges. Mr. Robertson suggested having the subcommittees submit their work plans to the entire Commission. Ms. O'Neill advised that each subcommittee should have a chairperson before commencing work.

Dr. Chatwin thanked the commission for their input.

New Business

Mr. Webster announced two upcoming meetings. The 2013 Maryland Shellfish Aquaculture Conference is scheduled for April 8 at the Doubletree Hotel in Annapolis. Several aquaculture producers from other states and Canada will be speaking about their experience in the industry, and there will be a session on marketing aquaculture products organized by Mr. Steve Vilnit of DNR. Contact Martha Milligan at (410) 827-8056 for more information or to register. The Interstate Seafood Seminar, a long-running program for shellfish sanitarians and health officials as well as industry, will take place in Rehoboth, DE, April 17-19. Contact Debbie Rouse at (302) 739-9939 for more information.

Public Comment

Mr. Ken Hastings of the Mason Springs Conservancy said that Charles County had benefited from the work done by DNR. Although the DNR land and water use tools are not perfect, nobody has come up with anything better. Mr. Hastings stated that nobody has come up with any data contradicting Ms. McGinty's results showing the impacts of development on fish, and that Ms. McGinty's work on land use and fish could be repeated with oysters. He mentioned that there is less protection of sensitive areas now than there was before Senate Bill 236, and that this bill favors a few select people. People would like to repeal this bill, but they are not looking at other ways to achieve conservation goals and protect sensitive areas.

Ms. Rachel Dean expressed concern that the public won't know who is on the OAC subcommittees and that subcommittees will be working in private. Dr. Chatwin said that the subcommittee membership will be available to the public, and that no decisions will be made in the subcommittee. Delegate O'Donnell said that it was critical that the subcommittees are transparent otherwise critical input may be missed.

Mr. Gibby Dean commented that commercial watermen have done substantial work on some of the issues to be examined by the OAC, including the fishery management plan and enforcement.

Watermen worked with Mr. Webster and Dr. Meritt on the fishery management plan, and participated in a task force that produced a 115 page report on enforcement. Industry supported Senate Bill 525 on enforcement, but the bill failed in the past because it used taxpayer money. Mr. Dean stated that the bill was rejected this year because it specified the number of police officers needed, and NRP objected to the bill because of new technology enabling them to get by with fewer officers. Mr. Dean stated that the county oyster committees were ineffective, and that he would like the watermen to have a more unified voice.

Closing

Dr. Chatwin adjourned the meeting at 7:10.

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Position: INFO

MARYLAND
DEPARTMENT OF
NATURAL RESOURCES

Larry Hogan, *Governor*
Boyd K. Rutherford, *Lt. Governor*
Jeannie Haddaway-Riccio, *Secretary*
Allan Fisher, *Deputy Secretary*

Bill Number: SB 979

Short Title: Dredging on Man-O-War Shoals - Prohibition

Department's Position: Letter of Information

Explanation of Department's Position

The Maryland Department of Natural Resources (DNR) provides the following information on SB 979.

House Bill 103 and Senate Bill 175 of 2009 directed DNR to apply for a permit to procure shell from Man-O-War shoals. In accordance with the law, DNR applied for and received a provisional permit from the U.S. Army Corps of Engineers (USACE). That permit is conditional on the subsequent award of a State Wetlands Permit, which requires Board of Public Works (BPW) approval. A full report on the proposed project was submitted to BPW by the Maryland Wetlands Administration. The U.S. Army Corps of Engineers (USACE) permit does not authorize work to begin as it is only a "provisional permit," and is conditional to obtaining a State Wetlands Permit.

Under the provisional application, the proposed project is highly structured and controlled to safeguard against any foreseeable environmental impacts that might occur during dredging. Environmental studies are required throughout the 5-year project, beginning in Year 1 even before shell dredging is allowed. Dredging can only begin in Year 2, if the USACE and the Maryland Department of the Environment (MDE) approve based on the results of the Year 1 studies. The environmental studies include in depth data collection on water quality, turbidity, fish populations, benthic populations, oysters, and bottom topography. Comprehensive monitoring is also required pre-, during, and post-construction on an ongoing basis.

The USACE provisional permit and the Maryland Department of the Environment report and recommendations have the following restrictions on shell dredging at Man-O-War to limit the potential impacts of the project:

- limiting number of cuts to approximately 10 (about 32 acres out of a total of approximately 450 acres)
- prescribing that the depth cannot cut all the way through the shoal
- prescribing the cuts shall be no more than 500' wide
- that undredged bottom be left between cuts

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- limiting the amount of shell to be removed over the 5 year period to 5 million bushels out of a total of approximately 100 million bushels available at Man-O-War Shoals (about 5%)
- restricting activity in Year 1 to environmental studies only
- restricting shell dredging in Year 2 to 2 million bushels
- that dredging can only occur after the USACE and MDE have reviewed and approved the results of the studies in Year 1
- prohibiting shell dredging in Year 3, while requiring environmental studies to continue
- prohibiting shell dredging in Year 4, while requiring that the environmental study results from Years 1,2,3 to be submitted to the permit agencies for review
- limiting shell dredging in Year 5 to the remaining 3 million bushels, but only if the agencies approve dredging based on the environmental study results from Years 1,2,3
- no dredging is allowed from February 15 through June 15 to protect anadromous spawning fish

Detailed studies, which include a final study to be submitted in Year 5, must include investigations into water quality, fish populations, benthic populations, oysters, turbidity, and bottom topography. A tally of bushels shall be provided showing the bushels used by the three oyster sectors: sanctuary, public fishery, aquaculture.

The oyster shell to be dredged from Man-O-War shoal will be planted on sanctuary bars for ecological restoration, aquaculture sites for private oyster production, harvest reserves, and open harvest areas for public fishery production. The allocation for shells has not been determined yet. DNR plans to conduct extensive stakeholder outreach in planning the project and deciding allocation.

Access to shell and substrate is important to the state's ability to continue its work in restoring oysters to the Chesapeake Bay. As shell becomes increasingly scarce, it may also negatively impact small business development for the commercial and aquaculture sectors of the seafood industry.

For any additional information, please contact our Legislative and Constituent Services Director, Bunky Luffman.